VOL. 173, NO. 4 AMERICAN OCTOBER, 1

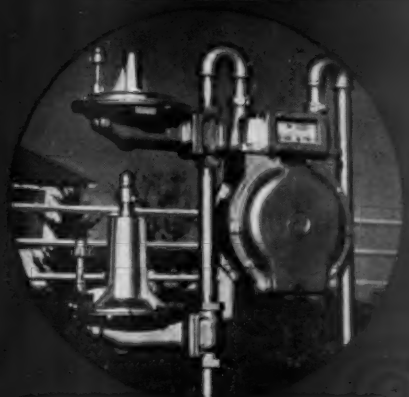
Gas Journal

NOV -8 19

REYNOLDS REGULATORS

ACCURATE
EFFICIENT
DURABLE

Plus a Greater Safety Factor



Dual Controls insure efficient—safe regulation on pressures too high to handle with one regulator. For very high pressure of 1,000 lbs., Reynolds make a tripple reduction. This natural gas line is in the southwest.

Reynolds Regulators have been first-in-the-field for more than half a century. They have risen to leadership in the gas control field because they have combined the correct factor of safety with each line of regulators simply operated and of proven superiority. Engineers have come to demand Reynolds Regulators . . . It's safe to specify Reynolds Regulators . . . They reassure safety . . . insure efficiency in Gas Controls.

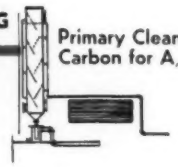
REYNOLDS GAS REGULATOR CO.
ANDERSON, INDIANA, U.S.A.

AUXILIARIES

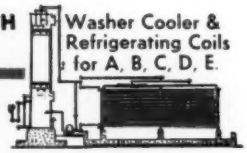
F Waste Heat Boiler for A, B, C, D, & Steam Accumulator

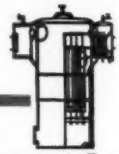
PURIFICATION

G Primary Cleaner of Carbon for A, B.



H Washer Cooler & Refrigerating Coils for A, B, C, D, E.





I Electrostatic Tar Precipitator for A, B, E.

J Naphthalene Scrubber for A, B, E.

K Relief Holder for A, B.

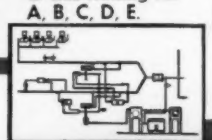
PURIFIED GAS

L Air Blowers, Exhausters, Compressors for A, B, C, D, E.

M Sulphur Purifier for A, B.

N Tar Separator for A, B.

O Automatic Enriching & Gas Mixing for A, B, C, D, E.



Projects and Equipment for

GAS PLANTS

RECENT

REFERENCES

A 6,000,000 CFD MILANO

C 1,300,000 CFD VENICE

F MILANO, VENICE

G MILANO

H MILANO, VENICE

I ROME (3), TORINO (2), FLORENCE (3), MILANO (2) 80,000,000 CFD

J MILANO

L ROME (5) TORINO (4), MILANO (6) 8,000 H P

N MILANO

O CAEN, VIERZON, CHAMBERY, LIMOGES (FRANCE) SAN REMO, MILANO (3), VENICE (ITALY)

North American Utility & Construction Corp.
North American Petroleum Gas Corp.
405 Lexington Avenue New York 17, N. Y.

FOUL GAS

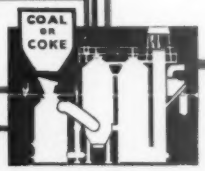
FOR REFORMING OR ENRICHING

NATURAL GAS, REFINERY GAS, PROPANE, BUTANE

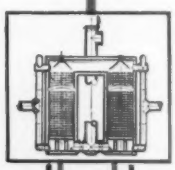
GAS OIL

HEAVY OIL

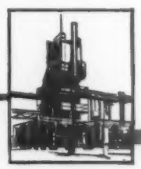
FUELS



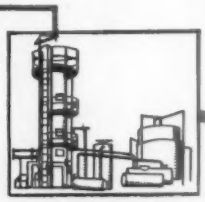
A CARBURETTED WATER GAS (Air and Steam)



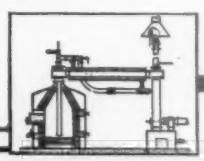
B OIL GAS (Air and Steam)



C CATALYTICAL REFORMING (Steam)



D HIGH TEMPERATURE REFORMING WITH CATALYST (Air and Steam)



E REFORMING WITH AIR OR OXYGEN

GAS GENERATORS

Enriching to Desired Heat Content

FROM FUELS — TO — FINAL GAS

Form E0502

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DEPT

Semet-Solvay means Service and Skill

why is this so?

Over a span of many years Semet-Solvay has served the Gas Industry and served it well, even through such difficult times as World War II. Semet-Solvay is still prepared to serve the Gas Industry in this period of conversion from manufactured to natural gas as well as in fighting the high cost of gas production.

Semet-Solvay has kept pace with the demands of the Gas Industry by introducing new processes, and improving design of equipment for the purpose of speeding up operations, increasing production capacities and reducing operating costs. Many gas companies have profited with this service by receiving the maximum production per dollar invested and at highest efficiencies.

Because Semet-Solvay always builds up to a standard; never down to a price.

Semet-Solvay has recently introduced its Regenerative High B.T.U. oil gas process. Semet-Solvay's usual standards of quality will be maintained, whether the installation is a new four chamber unit or even existing water gas apparatus converted to the Semet-Solvay process.

Let Semet-Solvay's representatives tell you all about this latest method of gas production at the Convention in Atlantic City. Booth #230.

Visit us at the GAMA Convention Atlantic City Booth #230

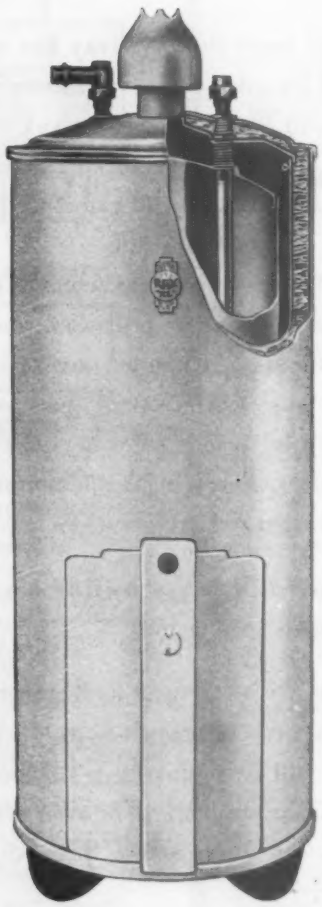
EQUIPMENT • ENGINEERING • CONSTRUCTION • OPERATION

SEMET-SOLVAY ENGINEERING DIVISION
40 RECTOR ST., NEW YORK 6, N.Y.
ALLIED CHEMICAL & DYE CORPORATION

AMERICAN GAS JOURNAL, October, 1950. Vol. 173, No. 4. Published monthly by American Gas Journal, at 73 Main Street, Brattleboro, Vt. Executive and Editorial offices at 205 East 42nd Street, New York 17, N. Y. Subscription prices: United States $3.00 per year; Canada $4.00; foreign $5.00; single copies 50 cents. Entered as second class matter January 24, 1950, at the post office at Brattleboro, Vermont, under the Act of March 3, 1879. Printed in U.S.A.

the new REX "XL"

BUILT TO SELL



THEY'RE NEW! Revolutionary! Never before a line of Automatic Water Heaters with so much sales appeal. They're the water heaters the public has dreamed about.

Six of the greatest values ever offered—six of the best gas water heaters ever offered. That's the new Rex "XL" line of Automatic Gas Water Heaters. Look at the brilliant styling—check their exclusive features—compare their recovery capacities—and you'll see why people everywhere are buying the new Rex "XL".

Stop at Booths 319-320-412-413 and see for yourself. For forty years Rex Water Heaters have been recognized everywhere as tops in performance—tops in quality. Typical of Rex quality is the new Rex "XL". Modern in design—heavily insulated—equipped with dependable automatic controls—heats water efficiently and economically —double extra-heavy storage tank protected by an "Elno" Anodic Rod.

In every detail of construction, design and choice of materials particular care has been taken to build a water heater that will give the most satisfactory service for years to come at consistently low operating cost. Without exaggeration, the Rex "XL" Automatic Gas Water Heater may be called

The Ultimate of Automatic Hot Water Service

THE CLEVELAND HEATER CO.

2310 Superior Ave. **Cleveland 14, Ohio**

AMERICAN Gas Journal
ESTABLISHED 1859

VOLUME 173 OCTOBER 1950 NUMBER 4

This month...

A subscriber writes us for a copy of the December 1942 issue of AMERICAN GAS JOURNAL, expressing interest in an article contained therein on Air Raid Precautions. We looked up the feature in question but our interest waned. Having just read "Atomic Attack: A Manual of Survival," we have come to regard the old fashioned block buster as a conservative, almost gentle form of lethal instrument. We strongly urge our correspondent to bring his investigations up to Bikini at least.

As annoying and almost as prevalent as the common cold are the press agents for manufacturers who flood us with releases that are by no stretch of the imagination news. One eager beaver has a follow-up system whereby we are badgered by a post card series: "Have you used the item we sent you about the new shelves in our tool room, and if so please send us a clipping." So far his batting average with the JOURNAL is zero.

We note that General Electric is laying plans for an intensive cultivation of the market for various lines of gas fired equipment. For twenty years gas men have been saying "What we need is a General Electric of the Gas Industry." Without obligation we are glad to suggest a slogan for G.E. Obviously: "The General Electric of the Gas Industry."

We look forward to renewing old acquaintances and reviving old feuds in the AMERICAN GAS JOURNAL Booth, No. 204, in the Atlantic City auditorium and exhibit hall. If you want to speak about your subscription see Miss Kelleher; if it is editorial material and news, talk to Howard Weeks; for advertising information, see Lew Hohl. And if you just want to complain about things in general, see The Editor.

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Elliott Taylor · Editor

Howard F. Weeks · Associate Editor

Arthur Rohman · Western Editor **John F. Falvey · Financial Editor**

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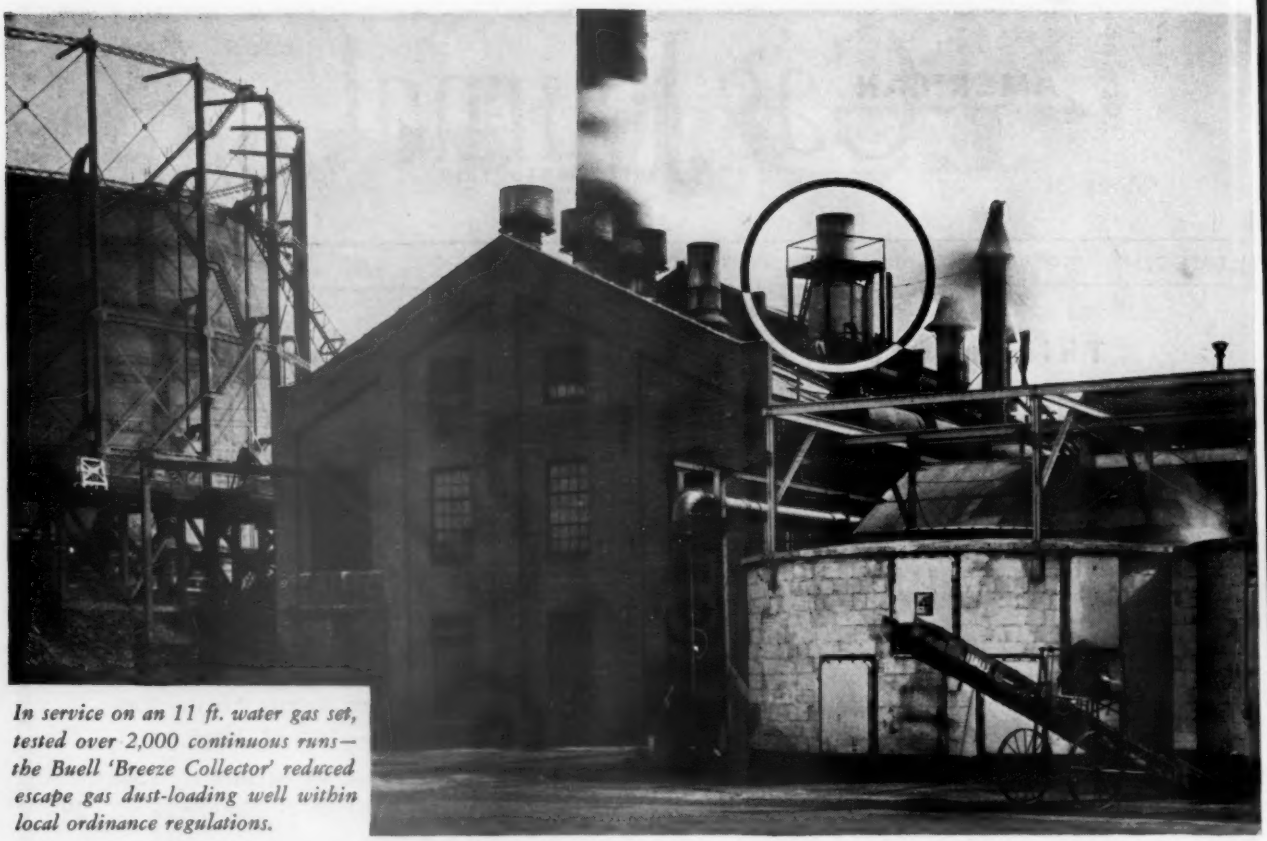


In service on an 11 ft. water gas set, tested over 2,000 continuous runs—the Buell 'Breeze Collector' reduced escape gas dust-loading well within local ordinance regulations.

See DUST ABATEMENT Performed RIGHT BEFORE YOUR EYES!

You'll want to examine this new Buell 'Breeze Collector'—especially the transparent, working model to be displayed at the A.G.A. Convention!

As you view this unique unit, pay particular attention to these outstanding advantages: No moving parts, no floor space required; easily installed in existing plants; no additional flare-back; no back pressure on super-heaters; no fans or motors needed.

MULCARE ENGINEERING CO., INC.
53 Park Place, New York 7, N.Y.

Sole Representative in the Gas Industry for the Buell Engineering Co.

VISIT
Booth No. 623
at the
A.G.A. CONVENTION
(OCTOBER 2-6)
for full information on the

buell
BREEZE
COLLECTOR
for Water Gas Sets

or write Mulcare Engineering Co., Inc.

This is test laboratory Number 39!

It could be right in your own neighborhood . . . one of the typical American homes in which Bryant has a test installation. Here, new features and equipment qualify under actual service conditions, make it possible for our dealers to sell truly *home-tested* heating.

These test homes have helped us to make equipment that is more efficient and more economical in operation, that requires less servicing. Through them, we have developed improvements that make it more profitable for dealers to *sell* and your gas users to *buy* Bryant automatic gas heating.

There's a Bryant distributor nearby, too, with warehouse stock which includes most everything in gas heating, from circulators to furnaces, from water heaters to boilers. There's engineering aid for the dealers' tougher jobs, co-operative advertising assistance for their localized campaigns.

Yes, Bryant meets the test . . . in home-proved equipment, in public preference, in working with our dealers. That's why gas utilities with the *most* Bryant installations along their mains have the *best-satisfied* customers.

Let the pup be furnace man
. . . and water boy, too!

bryant

AUTOMATIC HEATING

The most complete line of gas heating equipment in the nation

Bryant Heater Div., Dept. 198,
Affiliated Gas Equipment, Inc.,
17825 St. Clair, Cleveland, Ohio

( ) Send me the new booklet that tells the Bryant story. ( ) Have your distributor call on me.

Name_____

Company_____

Address_____

City_____ State_____

SHOCK STRENGTH

Without shock strength—or, for that matter—without all of the strength factors listed opposite—no pipe laid 100 years ago in *city streets* would be in service today. But, in spite of the evolution of traffic from horse-drawn vehicles to heavy trucks and buses—and today's vast complexity of subway and underground utility services—cast iron gas and water mains, laid over a century ago, are serving in the streets of more than 30 cities in the United States and Canada. Such service records prove that cast iron pipe combines all the strength factors of long life with ample margins of safety. No pipe that is provably deficient in any of these strength factors should ever be laid in city streets. Cast Iron Pipe Research Association. Thos. F. Wolfe, Engineer, 122 So. Michigan Ave., Chicago 3.

CAST IRON PIPE

Strength factors of Long Life!

No pipe that is provably deficient in any of these strength factors should ever be laid in city streets

SHOCK STRENGTH

The toughness of cast iron pipe which enables it to withstand impact and traffic shocks, as well as the hazards in handling, is demonstrated by the Impact Test. While under hydrostatic pressure and the heavy blows from a 50 pound hammer, standard 6-inch cast iron pipe does not crack until the hammer is dropped 6 times *on the same spot* from progressively increased heights of 6 inches.

CRUSHING STRENGTH

The ability of cast iron pipe to withstand external loads imposed by heavy fill and unusual traffic loads is proved by the Ring Compression Test. Standard 6-inch cast iron pipe withstands a crushing weight of more than 14,000 lbs. per foot.

BEAM STRENGTH

When cast iron pipe is subjected to beam stress caused by soil settlement, or disturbance of soil by other utilities, or resting on an obstruction, tests prove that standard 6-inch cast iron pipe in 10-foot span sustains a load of 15,000 lbs.

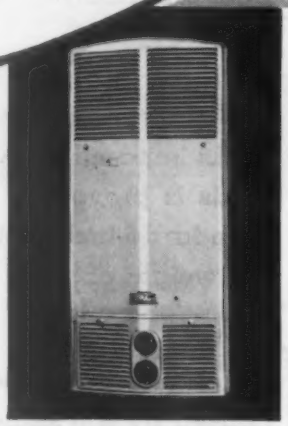
BURSTING STRENGTH

In full length bursting tests standard 6-inch cast iron pipe withstands more than 2500 lbs. per square inch internal hydrostatic pressure, which proves ample ability to resist water-hammer or unusual working pressures.

SERVES FOR CENTURIES

Only STEWART-WARNER "SAFETY-SEALED" Units bring *all* these advantages to *Zone-Controlled* Gas Heat!

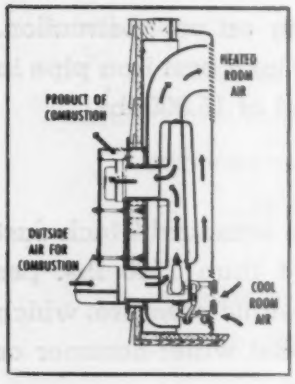
- Small, compact units applicable to one room, a suite of rooms or an entire building!
- All combustion products vented directly through a safety-sealed, exterior wall vent!
- No room air is used for combustion!
- Dependable, low-cost *zone-heating* with manual or thermostat control!
- Easily recessed into walls of wood, brick, plaster, stucco or cement-block construction!
- Rated inputs from 14,000 to 31,000 BTUs per hour!



2 model sizes assure the best possible answer for most heating requirements. Handsomely styled to suit any interior. The inside wall panel is available in Ivory, Beige or Aluminized finish.

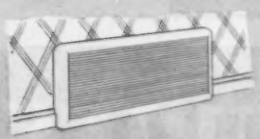
Model 991-14 14,000 BTU/HR
18" x 24" x 4"

Model 992-20 20,000 BTU/HR
18" x 38½" x 4"

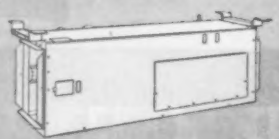


Exclusive "Safety-Sealed" design positively seals all fuel gas, flame and flue gases from contact with heated room air. "Safety-Sealed" exterior vent draws all combustion air from outdoors, vents all combustion products outside *through the wall!* Interior wall panel extends only 4 inches from the wall surface. Connects directly to the small exterior wall vent.

These Stewart-Warner Heaters are "Safety-Sealed," Too!



SOUTH WIND ZONE HEATING SYSTEM
Easily installed in any inside or outside wall. Two suitcase-size units heat average home. Automatically modulated forced-air heat. Thermostat control.



SOUTH WIND ZONE FURNACE
Compact, forced-air unit. Easily tucked away under the floor, in a closet or any convenient space. Short ducts from centralized installation. Thermostatic control.

This "Safety-Sealed" *Saf-Aire* model, for example, is a completely independent, automatic gas heating system that provides safe, reliable heat for an entire building, remote zone, or a single hard-to-heat room.

Every room or zone is heated to its individual requirements with new convenience, comfort and economy *unattainable* with conventional-type central heating plants.

Exclusive "Safety-Sealed" construction *seals* all combustion air and products from contact with heated room air. The patented exterior wall vent draws in *outside* air for combustion, then vents all combustion products outside.

Easy to install in any exterior wall, this versatile "packaged" heating unit needs no chimney, ducts *or electricity!* Only one utility connection is required—the gas line. No basement, closet or floor space is wasted.

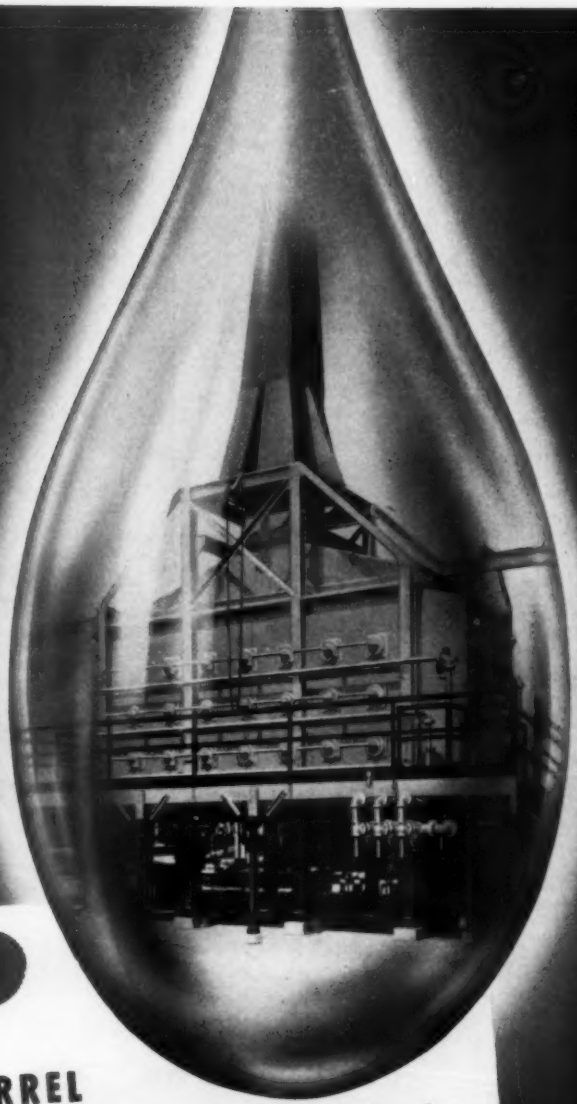
Now available with manual or thermostat control, Saf-Aire operates with equal dependability and silence on natural, manufactured or LP gas. Just set each unit for the desired level of heat, then forget it!

WRITE NOW for complete, free information and specifications on the complete line of Stewart-Warner "Safety-Sealed" Gas Heating Systems. Address inquiries to 1525 Drover Street, Indianapolis 7, Indiana.

Approved by American Gas Association

STEWART Safety Sealed WARNER
DOMESTIC HEATING

SQUEEZES MORE HIGH OCTANE OUT OF EVERY DROP!



Gradiation

TUBESTILL STEPS UP YIELD FROM EVERY BARREL

To an industry world renowned for its progressiveness, Selas Gradiation adds a new method of heat processing that increases the yield from every barrel of crude . . . that cuts costs, space and time. It is the new Gradiation version of the well-known tubestill.

Selas Engineers have designed, built and installed new tubestills that utilize all the advantages of the radiant heat of Gradiation. These stills achieve faster heat transfer, more complete combustion in smaller spaces, the elimination of hot spots and more exact control of temperature, pressure and timing. These new tubestills require fewer tubes and headers . . . less space . . . and a minimum amount of steelwork. The refiner can adjust heat transfer rates at any point—to shape the time-temperature heating curve of the fluid to any specification.

Does this advance with radiant heat give you ideas for your plant? Wherever heat is used in processing—petroleum, chemicals, metals, paints, ceramics, glass, foods, paper, textiles and printing—Selas Gradiation is opening new gateways to improved methods and product quality . . . establishing new highs in production rates.

If heat is a factor in the processing of your products, you will be interested in learning more about the new development in Gradiation achieved by Selas Engineers.

HEAT PROCESSING ENGINEERS FOR INDUSTRY...DESIGN, DEVELOPMENT, MANUFACTURERS

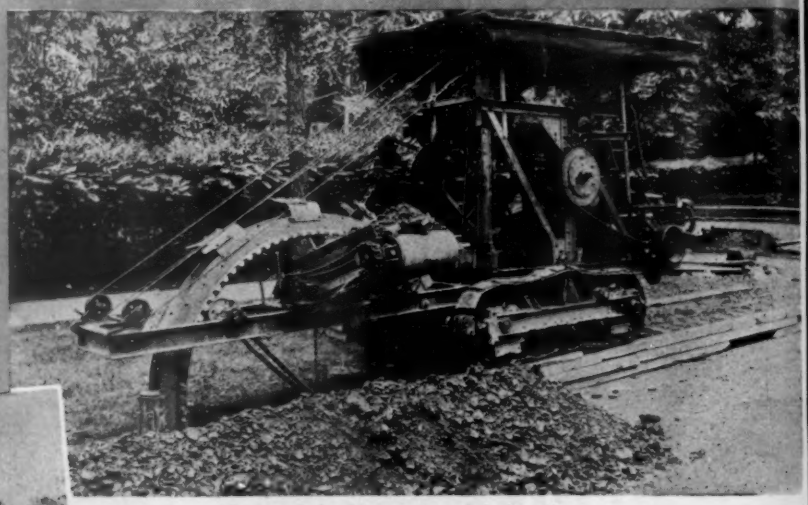
SELAS

SELAS CORPORATION OF AMERICA
PHILADELPHIA 34 PA

CLEVELANDS

in 1921

in 1950



The First Baby Digger at work in Detroit

More Trench FOR YOUR BUDGET DOLLAR

Almost 30 years ago the first CLEVELAND was developed "on the job" to fill the need for a trencher compact and maneuverable enough for the narrow clearances of city work—light enough to be moved quickly and profitably between short, scattered jobs—rugged enough to avoid wasteful shop-time and give a 12-month digging season—versatile enough to keep down the total machine investment—and fast and powerful enough to keep ahead of schedule no matter what the digging conditions. Through the years the basic CLEVELAND design has been continuously refined and perfected by close cooperation with the gas industry to produce 1950's CLEVELANDS—the perfect answer to your present and future trenching needs. Put them on your house services, your main extensions, your pipeline and distribution jobs long or short, tough or normal. These fast, tough economical machines give you more trench—and better trench—over a longer life—for every dollar spent. Call your local distributor or write direct for details.

See **"CLEVELAND"** *at* **AGA CONVENTION**

ATLANTIC CITY • BOOTHS 713-714
ALSO AT "THE AMBASSADOR" ROOMS 409-412

THE CLEVELAND TRENCHER CO.
20100 ST. CLAIR AVENUE • CLEVELAND 17, OHIO

MODEL 44 REDUCING REGULATOR

Here's a faithful worker for your general pressure reduction service. Designed to fit the job—in standard or special sizes. Built for years of loyal performance—in cast iron or cast steel. Model 44 meets every specification requirement—backed by Chaplin-Fulton . . . serving the industry since 1885.

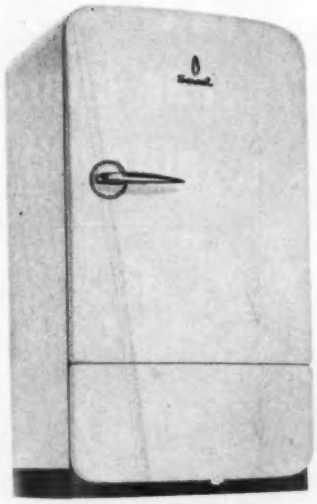
Other
CHAPLIN-FULTON
PRODUCTS

- **pressure reducing regulators**
- **diaphragm type relief valves**
- **cut-out latch regulators**
- **safety valves**
- **gas-fuel boiler governors**
- **regulators for compressor control**

ACCURATE CF MFG CO DEPENDABLE

Chaplin-Fulton
MANUFACTURING COMPANY
Pittsburgh 25, Pennsylvania

There are no finer GAS appliances than these . . .



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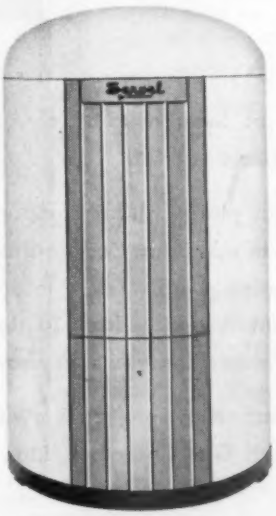

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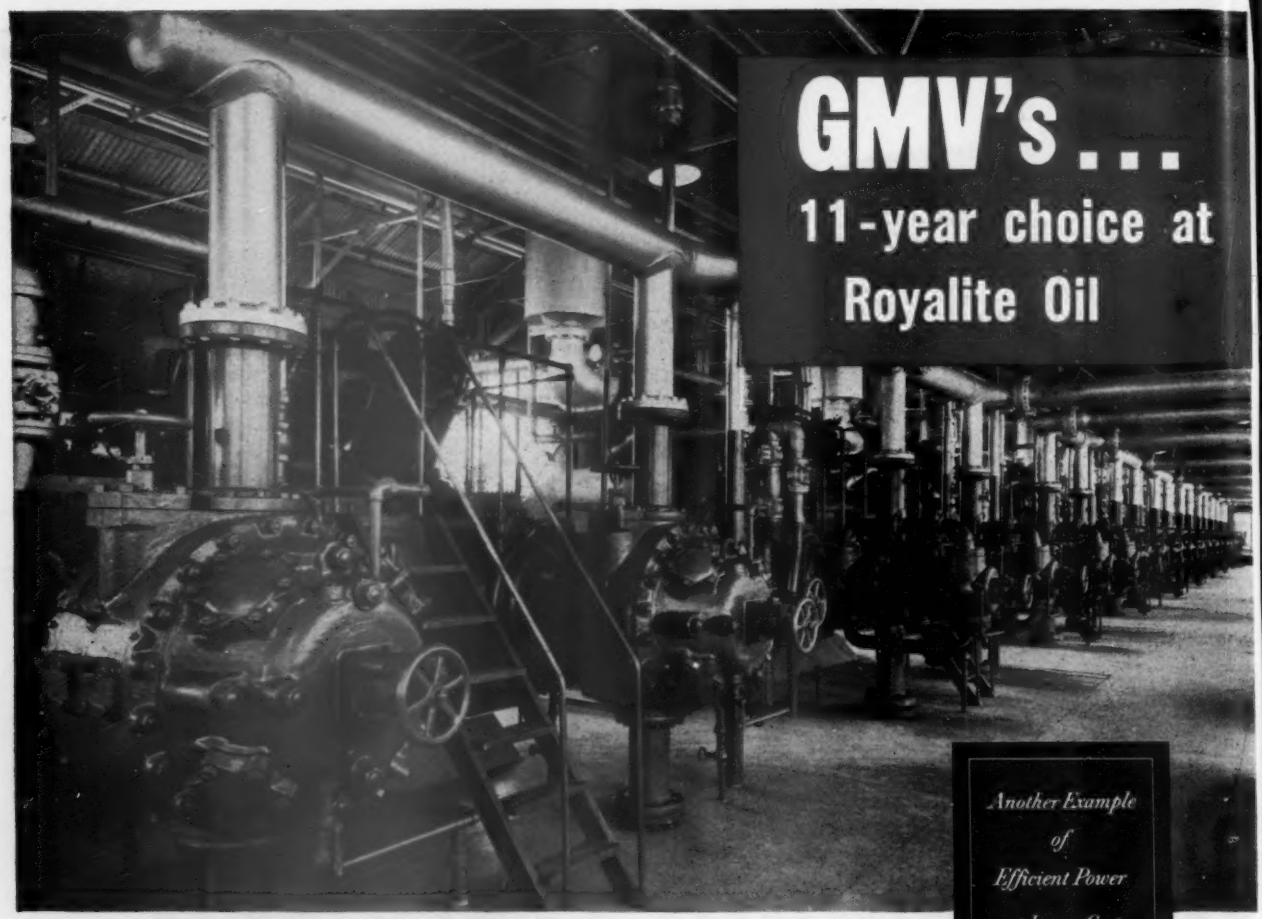

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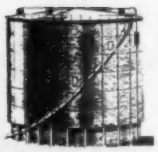

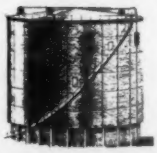

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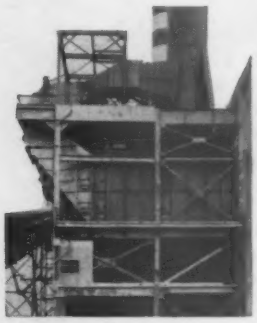

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Editorial:

No Middle Path

PRE-CONVENTION publicity on the thirty-second annual meeting of the American Gas Association has in the main followed the Bigger and Better theme that has become traditional with these congenial conclaves in years past. The Gas Appliance Manufacturers Association exhibit will be the largest ever held. Advance hotel reservations presage a record turnout of gas company representatives. And judging from the number of invitations in the mail, there appears to be no sign of any relaxation in the manufacturers' grim determination to entertain down to the last dried out hors d'oeuvre, the ultimate waterlogged martini.

On the face of it one could easily come to the conclusion that everything is as it always was—or more so. Bigger shows, better speakers, greater opportunities, finer products, larger expansion, higher proof whiskey and more good clean fun.

But we suspect that even though the old trappings will be in evidence, there will be little disposition on the part of gas men to deceive themselves as to their shallow significance. The impending struggle for survival, with its mounting demands for war materials and manpower, the already perceptible throttling off at the source of non-essential civilian goods, the inescapable conviction that things can get much worse before they become any better, cannot be ignored even in the midst of meetings geared to optimism and good cheer.

Regardless of the prearranged program, rich in its promise of inspirational prose, broad in its scope of coverage of every day utility problems, the main thought of the convention will inevitably turn toward the implications, the obligations and the opportunities that will face the gas utilities as the nation girds itself for the defense of the principle of freedom in the world.

Undeniably the gas industry of 1950 is in better condition to serve both war and civilian needs than it was prior to Pearl Harbor. Despite the widespread replacement of manufactured gas by natural gas, manufactured gas produced and purchased by utilities has climbed from 369 billion feet in 1941 to 496 billion last year. The total marketed production of natural gas has increased from 2,813 billion feet to 5,600 billion in the same period. And natural gas reserves which were estimated at 114 trillion cubic feet in 1941 have now climbed to over 180 trillion.

Much of the post war natural gas expansion program is already completed, and before the end of the coming winter, hundreds of new communities, thousands of industries and millions of homes will be within economical reach of natural gas pipe lines for the first time.

Thus, from a material viewpoint, as an energy asset to the nation, ready and available for immediate use, gas is in position to give unexcelled service. It is in the fields of business statesmanship—of adaptation to and service in behalf of national defense—that the present great challenge lies.

Superlative new gas appliances, designed and put on display with a view to capturing an ever increasing market, may well have to be curtailed in production as civilian output yields to the needs of the military. Then the obligation of the gas utilities will become one of making the maximum effective distribution, where the need is greatest, of the limited numbers that are available.

Quite conceivably this may require a complete reversal of sales policies on the part of those utilities that have retired from the field of direct merchandising in the interest of stronger dealer cooperation. There are many opinions on the advisability of direct utility merchandising, but the fact remains that only the utility has any stake in either the type or distribution of the load that is added to its lines. The sale and installation of appliances with respect to load balancing or consumer need is no concern of the gas appliance dealer, nor can it be expected to be.

Public utility expansion programs, load building plans and promotional schemes that but recently seemed not only desirable, but essential to the normal growth of the industry, may take second place under the system of controls and emergency allocations of fuels that the emergency will bring into being. And yet, while a gas company may exert itself to the utmost to assure an equitable and adequate distribution of its service, it cannot afford to lose sight of the fact that even in a war economy the competitive element is still present. Cooking load lost to electricity, for instance, is lost just as surely, and probably as permanently, if it occurs during a war, as it would be were it snatched away in the normal fight for peace time business.

While all of the myriad restrictions and limitations are being imposed, the gas industry, in common with all business, will be obliged to so conduct its affairs that the end product of increased emergency regulation does not develop into a pattern of permanent regimentation that even a victorious peace could not undo.

There is a rugged road ahead for America. There is an heroic role awaiting the gas industry as American traverses that road. The thirty-second annual convention of the American Gas Association will be written in industry history as either a momentous dedication to that task, or as a monstrous carnival of self-delusion and flippancy in time of dire national peril. There is no middle path.

Elliott Taylor

Survey Shows State Commission Trend Toward 'Fair Value' Rate Bases

by John F. Falvey

John F. Falvey

SHARPLY increasing costs of construction and operation have raised in the minds of investors and of utility managements alike the serious question as to how the public utility industry—electric, gas and combination companies—will fare under a continuation of the inflationary spiral now in evidence.

This uncertainty is aptly shown in the recent market performance of public utility company stocks. According to the Dow-Jones Averages—one of the leading indices—utility shares at the time this article was written had regained only about one-third of the loss which they had sustained immediately following the inception of the so-called "police action" in Korea.

In contrast to this, the more volatile industrial averages had recaptured three-fourths of their loss during the same period.

With a view to resolving such doubts, and to ascertaining the real trend of utility rate developments throughout the country, the AMERICAN GAS JOURNAL on June 28, last, undertook a study of recent state commission and court decisions on rate matters and of commission reaction to the difficulties attending raising of new capital on a satisfactory basis by means of equity stocks.

The evidence points to a decided swing of the rate pendulum in the utilities' favor. Recent court decisions in two states, and a decided swing in commission thinking in another, give ample evidence of permitting utilities to reflect in their rate base the continuing rise in construction costs.

Equally important, the majority of state regulatory commissions do recognize the necessity for allowing utility companies' earnings on the rate base sufficient both to adequately service existing capitalization and to attract at an advantageous yield rate the new capital needed for further plant expansion.

Forerunner among adherents of new rate concepts was the Idaho Public Utilities Commission in its decision of June 29, 1950, granting the increase in rates requested by Lemhi Telephone Co.

The company concerned is small but the decision constitutes a decided departure by a majority of the commission members in swinging to a rate base of reproduction cost new from its past policy of historical or original cost.

In its shift, the commission majority took advantage of Section 61-402 of the Idaho Code Annotated which permits use of replacement cost of property for rate purposes in the event original cost and depreciation charges cannot be obtained.

50% Increase in Rate Base

The commission stated in its opinion that: "In this, and in similar previous proceedings we have been unable to determine the actual original cost of *all* the property of The Lemhi Telephone Company." (Italics by the author.)

The commission accepted company testimony of values based on January 1, 1948, costs of materials and on labor costs as they had been contracted for since 1947 and, after disallowing only two minor items, gave the company a reproduction cost new rate base as of January 1, 1948, approximately 50 per cent in excess of the figure which it had allowed only one year earlier on the basis of original cost, the yardstick previously used.

The commission also increased the allowance for depreciation to 3.97 per cent of property account from 2¼ per cent, an increase of better than 75 per cent in the dollar amount of annual accruals to the reserve.

In its decision the Idaho commission actually substituted present prices of labor and material for the much lower cost actually incurred many years ago.

Equally as far-reaching was the decision of the Supreme Court of New Jersey on June 27, last, in ordering Public Service Co-ordinated Transport (affiliate of Public Service Electric & Gas Co.) to reduce fares on its statewide transportation system to five cents, from seven cents previously charged. The decision was an unsatisfactory one from the standpoint of Co-ordinated Transport, but one which betokens more favorable treatment than heretofore for other utilities throughout the state.

This is because the court in its decision set "fair value" as the yardstick to be used in determining utility rates. The decision is a considerable change from that which motivated the Board of Public Utility Commissioners just five years ago to order a reduction of $67,893,724—or 27 per cent—in the electric and common electric-gas accounts of the Public Service Electric & Gas Co. to bring them to the basis of original cost of $257,786,741 as of January 1, 1938.

The court said: "There are a number of formulae useful in the determination of fair value: Depreciated original cost, depreciated prudent investment, reproduction cost of the property less depreciation, cost of reproducing the service as distinct from the property, and there are undoubtedly others. But the Board is not bound to and, indeed, should not use any single formula or combination of formulae in arriving at a proper rate base for the determination of fair value is not controlled by arbitrary rules or formulae, but should reflect the reasonable judgment of the Board based upon all the relevant facts. . . ."

July Decision in New Jersey

The New Jersey Board of Public Utility Commissioners on July 6, 1950, followed the precepts laid down by the State Supreme Court in the Co-ordinated Transport case when it held in the case of Pennsylvania Railroad, Pennsylvania-Reading Seashore Lines-Reading Co. case (dockets 4868-9-70) that: "The rate base is the fair value of the property of the public utility that is used and useful in the public service."

Mr. Falvey points out "the necessity for allowing utilities companies' earnings on the rate base sufficient . . . to attract . . . the new capital needed for further plant expansion." (Photo—Transcontinental Gas Pipe Line Corp.)

Further extending the skein of evidence favorable to the utilities was the ruling of the Circuit Court in Illinois on August 17, last, in favor of Illinois Bell Telephone Co. in its rate contest with the Illinois Commerce Commission.

The regulatory body in its determination of the "fair value" of the telephone company's property actually had used "original cost," the court said, whereas it should have considered replacement costs.

The court indicated that a true finding on the rate base should be somewhere between the $510,377,881 set by the company and the $365,676,465 estimated by the commission.

These several new adherents to "fair value" and "reproduction cost new" methods of evaluating utility property for rate making join the long list of other states which have adopted a more liberal attitude toward the problem. Among these are: Montana, with present value; Pennsylvania, fair value; Kentucky, which follows the fair value theory enunciated in New Jersey; South Dakota, net investment but with a leaning to reproduction cost new where accurate retirement records have not been maintained; and Louisiana, prudent investment, adopted in 1946. Numerous others could be added to the list. Some of these, too, it might be mentioned, are fairly recent converts to their present yardsticks.

The prudent investment theory, in the words of the Louisiana Public Service Commission, might be described as follows: "The rate of return to be allowed should be a percentage of the rate base which will yield enough money after all reasonable operating expenses, maintenance, taxes, annual retirement or depreciation appropriations and amortization of utility plant acquisition adjustments (the excess of purchase price over original cost) have been paid or set aside, to pay bond interest and sufficient stock dividends to maintain the credit of the utility, *attract new capital*, reward good management and to enable the investor to recoup at any time the money he has prudently invested." (Italics by the author.)

Whatever the yardstick which the individual state commissions espouse in their rate proceedings, the trend toward 'prudent investment' is evident in the large number of commissions which inject into their deliberations consideration of the utility's new capital needs. *No less than two-thirds of the commissions give varying degrees of thought to this need.*

A realistic approach along this line, and second to none, is that taken by the Public Utilities Commission of the District of Columbia which for a considerable number of years has been using a "Modified Sliding Scale Plan" of rates. Under this plan the utility retains one-half of any excess of earnings over the allowable, the other half being placed in a deferred credit account for possible refunds to consumers or for offsetting any future deficiencies in earnings. The electric company still operates under this plan but it is not applicable to the local gas company which terminated the agreement in October 1947, because of modifications which would have become necessary because of the changeover to natural gas then coming about.

The District of Columbia commission premises its study of rates initially on the cost of capital to each of the utilities. In these studies weight is given to actual cost of debt and preferred stock, plus a reasonable return on the equity. To determine a reasonable return the commission weighs the price and dividend earnings ratios of the particular company under review, where available; otherwise it falls back on similar data for correspondingly situated utilities.

"It is customary in rate determinations," the District of Columbia Com-

mission says, "to consider forecasts of both operating income and rate base elements for the following 12-month period. In this way provision is made for return on new capital that might be required in the immediate future. Furthermore, in fixing the rates of return . . . , in addition to what may be termed 'bare bones' cost of capital, the Commission has allowed, in its judgment, a sufficient margin of earnings to permit the attraction of new capital."

The Connecticut Public Utilities Commission attitude on this important question is shown in its treatment of Connecticut Light & Power Co. In its order permitting the requested increase in rates the commission expressly recognized the need for adequate earnings to finance expansion. It took the capital requirements for the following year, apportioned them equally between debt, preferred and common stock and allowed an interest rate of three per cent on debt, dividend rate of five per cent on the preferred and estimated earnings of $3.75 a share on the common stock. This return on the common stock should, it stated in its opinion, be sufficient to attract investors to an offering of additional common stock in the ratio of one-third the new capital needs.

The New Jersey Board of Public Utility Commissioners has adopted the same approach. "The Board considers the need of a utility company for a return in dollars sufficient to service its outstanding securities and attract needed additional capital," it says in commenting on the recent State Supreme Court decision. "In a particular case such a consideration could have much weight. . . . We subscribe to the doctrine in the 'Hope Case' (Federal Power Commission vs. Hope Natural Gas Co. decided by the United States Supreme Court) that the 'end result' must be reasonable."

"To Raise Money"

On this point, it states: "The New Jersey Supreme Court in its decision in the Public Service Fare Case . . . said: 'We can say, however, that the rate which a public utility may reasonably charge should be sufficient . . . to enable it to raise money necessary for the proper discharge of its public duties."

In two important rate cases decided this year the Michigan Public Service Commission described itself as adhering to a "fair value" basis in determining a proper rate base.

In so doing it recognized specifically, and so stated, the need for permitting the company earnings sufficient to obtain needed new capital on a satisfactory cost basis.

The cases in question were Consumers Power Co. and Michigan Bell Telephone Co. The former was decided on January 4, 1950, and the latter on June 19, last.

A proper rate base for a utility company must be the fair value of its property, the Michigan commission said in a two to one decision as it gave Consumers Power Co. a fair value rate base of $330 million, compared with the range of $337 to $345 million requested by the President of the utility.

"In determining a reasonable rate of return," the commission went on to say, "we deem it necessary to consider the cost of money, the company's financial structure, its construction program, *and its need for raising additional capital.*"

In the telephone company case the Michigan commission said that its choice of a rate base, using sound judgment, would be somewhere between original or historical cost and present fair value as it set the rate base at $350 million in another two to one decision with the same member dissenting as in the Consumers Power Co. case.

"We have found," the commission said in its opinion, "that the proper rate base is $350 million and *that the rate of return required to attract capital and to insure confidence in the financial soundness of the utility* is six per cent."

This line of thinking was followed closely by the Public Service Commission of Kentucky on April 6, last, when under edict of the Kentucky Court of Appeals it completely reversed its previous decision and granted Lexington Telephone Co. the full amount of the rate increase which the company had put in effect in November, 1947, but which was suspended by the Commission after a hearing.

Whereas the Commission originally had based its findings on historical or original cost, it fell back in its final decision on the celebrated "Hope" case doctrine that the final result, by however means it be reached, dictated that: "The company had a right to ask that its financial integrity be maintained."

This was the express statement of the Kentucky Court of Appeals which also referred to the court finding in the Hope case that: "The investor interest has a legitimate concern with the financial integrity of the company whose rates are being regulated. From the investor point of view it is important that there be enough revenue not only for operating expenses but also for the capital costs of the business. These include service on the debt and dividends on the stock. * * * That return, moreover, should be sufficient to assure confidence in the financial integrity of the enterprise, *so as to maintain its credit and to attract capital.*"

"An examination of the company's capital structure," the commission said in its recent opinion, "reveals a dire need of equity moneys. * * * The company must, of necessity, take steps to secure through some source large amounts of equity capital to balance a capital structure top-heavy with debt securities if a healthy capital ratio consistent with sound financial policies is to be adhered to. *Certainly public interest requires that any utility be properly financed and that condition maintains only where earnings are adequate to allow the needed capital to be obtained at the lowest possible cost.*"

The Wisconsin Public Service Commission is another state body which gives serious consideration to the cost of capital and capital requirements of the individual utility in determining the rate of return which should be permitted.

"In certain instances," it reports, "the Commission has authorized temporary rates due principally to the fact that earnings of the utility temporarily were at such a level that financing could not be accomplished at reasonable cost without improved earnings. In each of the cases where this treatment was adopted, the utilities involved required immediate and substantial property additions in order properly to meet their service requirements."

Other Commissions, Too

Numerous other state regulatory commissions could be quoted in their own words in evidence of their recognition that the rate of return permitted the individual utility must be sufficient to permit it both to retain its financial integrity and to attract the additional new capital without which it could not put through its required property expansion.

Continuation of this favorable trend until it encompasses all state regulatory bodies will be welcomed by managements of the gas industry, whose projected expansion still is large despite the great strides already taken, and by investors who are being looked to for the proportionate share of equity stock dollars needed to finance the expansion program of the industry.

State Commissions Explain Their Position

California

Rate Base Used:
Historical Cost

Rate of Return:
5.6 per cent—5.9 per cent

New Capital Consideration

It has not been the policy of the California Public Utilities Commission, *as yet at least* to fix rates solely on the basis of financial requirement regardless of the rate base or rate of return. *The commission's policy, however, is to fix rates designed to yield a reasonable return on the investment.*

Connecticut

Rate Base Used:
Original Cost

Rate of Return:
5 per cent—7 per cent

New Capital Consideration

The Connecticut Public Utilities Commission expressly recognizes a utility's need for a rate of return sufficiently high to attract needed new capital and it indicated its feelings in this respect in the case of Connecticut Light & Power Co. (Commission Docket No. 8,168). In this case the Connecticut commission took the company's capital requirements for the following year, apportioned them equally between debt, preferred and common stock and allowed an interest rate of three per cent on bonds, a dividend rate of five per cent on the preferred stock and estimated earnings of $3.75 a share on common stock, as necessary to attract investors to an offering of additional common.

District of Columbia

Rate Base Used:
Original Cost

Rate of Return:
Electric Companies—5.5 per cent
Gas—No specific rate in last case but for years the Public Utilities Commission of the District of Columbia had calculated six per cent.

Increase in recent case estimated to produce approximately six per cent in immediate future, giving consideration to increase in number of customers and to decline in rate base owing to amortization of property losses and of the costs of changeover to natural gas.

New Capital Consideration

It has been the custom of the District of Columbia Public Utilities Commission in rate determinations to consider forecasts of both operating income and rate base elements for the following 12-month period. In this way, provision is made for return on new capital that might be required in the immediate future.

"Sharply increasing costs of construction. . ."

Furthermore, in addition to what might be termed "bare bones" cost of capital, the commission has allowed, in its judgment, a sufficient margin of earnings to permit the attraction of new capital. This factor would be taken into account in any necessary future revision of the rate of return.

In addition, retention by the utility of one-half of earnings above the permissible rate of return—permitted in the case of the electric company—in itself operates as a medium to attract new capital.

The gas company has no substitute plan to replace the "Modified Sliding Scale Plan" which was terminated at its request October 24, 1947, after having been in effect since July 1, 1935. It was dropped because of modifications that would have become necessary because of changeover to straight natural gas. Rate of return was cut to six per cent in 1944, from 6.5 per cent.

Under the modified plan the electric company retains one-half of any excess of earnings over the allowable, the other half being placed in a deferred credit account for possible refunds to customers or for off-setting any future deficiencies in earnings. Under the plan provision is made for either the company or the commission to initiate rate proceedings.

Rates of return have been premised initially on a study of the cost of capital to each company. In these studies weight is given to the actual cost of debt and preferred stock money, *plus a reasonable return on the equity.*

In arriving at a reasonable return to be allowed on equity capital, considerable weight was given to investor appraisal of the equity securities, if available, as measured by price-earnings ratios and dividend-price ratios. In the absence of investor appraisal of the equity securities of the company under review, resort was had to similar data for other similarly situated companies.

Substantial changes in capitalization of the utility and in the over-all cost of capital, including a reasonable return on equity capital, will be given consideration by the District of Columbia Commission whenever it appears necessary to do so.

Idaho

Rate Base Used:
The Idaho Public Utilities Commission changed to reproduction cost new, from the past policy of historical or original cost, in the case of Lemhi Telephone Co. (subsidiary of Northern Pacific Railroad Co.) decided on June 29, 1950.

Rate of Return:
6.22 per cent

New Capital Consideration

The Idaho commission reached a split in its thinking in the case mentioned, but the majority accepted all but a very minor portion of the parent company representative's valuation on a reproduction cost new basis *even where a substantial amount of original cost data was available and had been used in previous rate proceedings.*

The majority opinion gave the company a rate base about 50 per cent higher than had been allowed a year earlier and also increased the depreciation allowance to 3.97 per cent of reproduction cost against the previously permitted allowance of 2.25 per cent on

original cost—an increase of 75 per cent in dollar accruals to the reserve.

Kentucky

Rate Base Used:

Explained Below

Rate of Return:

The Kentucky Public Service Commission enjoys wide scope under the law, which states that: "In fixing the value of any property . . . the commission shall give due consideration to the history and development of the utility and its property, original cost, *cost of reproduction as a going concern, and other elements of value recognized by the law of the land for rate-making purposes.*"

New Capital Consideration

The feature of the Kentucky law mentioned gives the commission wide latitude in deciding rate cases, a factor which is indicated by its decision in the case of the Lexington Telephone Co. decided on April 6, 1950.

In this case the commission granted in toto the rate increase put in effect by the company in November 1947, but suspended by the commission at that time. The commission in its original finding based its conclusions on historical cost of the property, but the Kentucky Court of Appeals in reversing both the commission and the Franklin Circuit Court (which had upheld the commission) stated that, "The case strikes us as being one aptly appropriate for the conference table," and it added that the return originally permitted by the commission was "insufficient to service the company's financial obligations, without reference to any sum required for admittedly needed extensions and improvements of the company's service. . . . The company had a right to ask that its financial integrity be maintained."

Following the mandate of the court as stated and as implied in the law the commission has followed the pattern of the Hope case (Federal Power Commission versus Hope Natural Gas Co.) decided by the United States Supreme Court that any and all methods of approach may be used in a rate case provided the end result is reasonable.

Louisiana

Rate Base Used:

Original cost, but allows the utility to amortize the excess cost of purchase price, if any, over original cost by charges to operating expense.

Rate of Return:

6 per cent

New Capital Consideration

While the Louisiana Public Service Commission recognizes the need for adequate rates in order for a utility company to attract new capital, it has never given specific weight to this fact. It assumes that if a utility is earning a return of six per cent (a figure to which the commission has adhered) *and is not overburdened with debt capital,* new capital is readily available.

(Availability of sufficient earnings to attract new equity money is directly synonymous with a balanced capital structure. AUTHOR.)

Maine

Rate Base Used:

Original Cost

Rate of Return:

Explained Below

New Capital Consideration

"We do try to get the earnings of the utility so that it can attract new capital," the Maine commission reports, "and use the rate base and rate of return in working out this final result. It is a matter of the individual company's needs.

"We have been using price-earnings ratios adjusted to get at a rate of return which would provide sufficient revenues to attract additional capital which most utilities have been in the market for during the last few years.

"The earnings-price ratio runs somewhere around six per cent, maybe a little more, and where there has been no proof as to the required rate, we have used the six per cent amount."

Missouri

Rate Base Used:

Original Cost

Rate of Return:

"This Commission adheres to no fixed rate of return for all companies," it states. "The Commission endeavors to fix a rate of return that will enable a company to pay all legitimate operating expenses, meet its fixed charges, *and earn a return sufficient to pay reasonable dividends necessary to attract capital.*"

New Capital Consideration

"In our determination of rate changes," the commission further states, "we have constantly given consideration to a rate of return which, in our opinion, was sufficient to enable the utility to attract new capital, even though no such item was added to the rate base or set out as any specific amount in the rate of return, and it is not likely that a designation as such will come to pass."

Montana

Rate Base Used:

Present Value. (In arriving at present value the Public Service Commission of Montana is not limited to the evidence which it may receive.)

Rate of Return:

The Commission reports that it has not found it necessary for the past few years to determine either a maximum or a reasonable rate of return and has refrained from doing so.

New Capital Consideration

The Montana Commission follows the rules set forth by the Montana Supreme Court in the case of Tobacco River Power Co. vs. Public Service Commission in which case the court held that: "In exercising its power of regulating rates of a utility company it (the commission) appraises the value of the property, determines from evidence the cost and expense of operating the utility, *allows for* depreciation and *fair return on investment,* and thereupon fixes rates for service."

(This is substantially the doctrine of the Hope case—AUTHOR.)

Nebraska

Rate Base Used:

Original Cost

Rate of Return:

5.5 per cent—6.5 per cent

New Capital Consideration

"In the decisions of this Commission," the Nebraska State Railway Commission says, "the factor of the utility meeting a certain amount of net return to attract new capital is always present, especially on the major utility corporations. It is the opinion of this commission that the net return allowed against the rate base answers this factor and, if the utility can earn that much, it will have no trouble in obtaining funds."

New Jersey

Rate Base Used:

No hard and fast formula. Each case stands on its own merits. Follows Hope case decision wherein end result is paramount.

"Fair Value," as a means of determining utility rates was the dogma, however, recently handed down by the New Jersey Supreme Court in the case of Public Service Co-ordinated Transport Co. when fares were ordered reduced to five cents a ride, from seven cents.

"Fair Value" includes use of any number of rate methods but the end result is what governs the State Commission in its findings.

"The Board (of Public Utility Commissioners) is not bound to, and indeed should not, use any single formula or combination of formulae in arriving at a proper rate base," the court said, "for the determination of fair value is not controlled by arbitrary rules or for-

(Continued on page 59)

New Industrial Development Pattern Set By Consumers Power Company

by D. M. Mackie
Commonwealth Services Inc.

CONSUMERS Power Company is the largest gas and electric utility in the United States not serving a metropolitan area, and Justin R. Whiting, President of Consumers, has translated those circumstances into an asset for the development of "Outstate Michigan" as a compact industrial empire having its own distinguishing characteristics.

Mr. Whiting has dramatized these economic values by instituting a national advertising program having as its goal the continued and well-rounded development of an area to which he has given this identifying term "outstate Michigan." This service area of the company covers more than 26,000 square miles, reaching from the Ohio border to the Straits of Mackinac, and from Lakes Erie and Huron to Lake Michigan.

More than industrial development as such, the program envisions community and rural development as collateral to sound economic progress. And more than a development program concerned only with the location of industries, the manufacture of products and the expansion of employment, Mr. Whiting's philosophy of growth embraces the social values that contribute to the people's standards and conditions of living.

Consequently, the company's messages embrace not only "the facts of life" industrially, but also those elements of home and community life, education and recreation so necessary to life outside the working hours, and with which "Outstate Michigan" is so richly endowed.

The company's gas or electric services, or a combination of both, are supplied to more than 1,300 communities. Gas service is supplied to more than 300,000 customers in 258 communities with a population exceeding 1,500,000. The population of the largest cities served ranges from 175,000 to 50,000.

With the trend toward industrial decentralization and with numerous major or prime industries establishing manufacturing, assembly or fabricating plants in smaller communities of these sizes, the nature of this territory presents the very advantages sought for such purposes. Co-incident with this phase of industrial development, manufacturers of components or organizations for the supply of parts for major industries find similar advantages in locations in a territory offering the economic and social values of a non-metropolitan region.

Justin R. Whiting, President, Consumers Power Co., outlining 1951 industrial development program as related to gas operations. At left is Horace Brewer, director of industrial development, and at right is Don Herringshaw, general supervisor of gas operations.

Industrial development of this nature leads to parallel growth of housing, new commercial enterprises and trading areas, from all of which the company stands to benefit in the resultant growth of domestic and commercial business, as well as industrial.

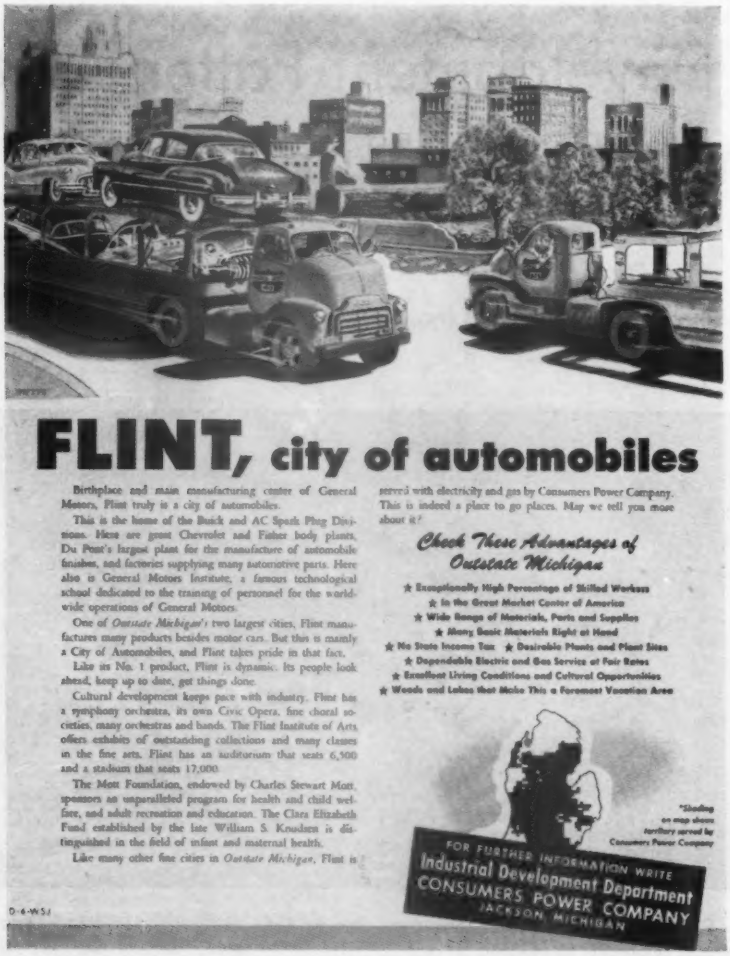
The company supplies natural gas to all but one of the 258 communities served with gas. Gas sales for the 12 months ending August exceeded 24 billion cu. ft. Natural gas is supplied principally from the Texas-Oklahoma-Kansas fields, transmitted by Panhandle Eastern Pipe Line Co., with a limited amount from small Michigan fields.

Of major importance, and highly significant as a factor of firm gas supply the year round, is the company's underground gas storage development, one of the largest in the nation. This operation is conducted by Michigan Gas Storage, a subsidiary owned 75 per cent by Consumers and 25 per cent by Panhandle.

The gas storage fields cover 47,000 acres and currently are supplying better than 20-billion cu. ft. of gas in the annual cycle. The advantage of this vast storage reservoir, into which gas is pumped during the summer season for use in the months of high demand, is readily apparent to industries contemplating gas utilization for the expanding number of processes in the industrial field.

It has also proved an important factor, not only in new housing developments, but also in existing homes as a means of automatic heating. The company expects to have a total of more than 100,000 space heating customers by the end of this year.

The industrial development program was instituted by Mr. Whiting in January 1950 with the inauguration of a national advertising program and the re-establishment of an industrial development de-


FLINT, city of automobiles
Birthplace and main manufacturing center of General Motors, Flint truly is a city of automobiles.
This is the home of the Buick and AC Spark Plug Divisions. Here are great Chevrolet and Fisher body plants, Du Pont's largest plant for the manufacture of automobile finishes, and factories supplying many automotive parts. Here also is General Motors Institute, a famous technological school dedicated to the training of personnel for the world-wide operations of General Motors.
One of Outstate Michigan's two largest cities, Flint manufactures many products besides motor cars. But this is mainly a City of Automobiles, and Flint takes pride in that fact.
Like its No. 1 product, Flint is dynamic. Its people look ahead, keep up to date, get things done.
Cultural development keeps pace with industry. Flint has a symphony orchestra, its own Civic Opera, fine choral societies, many orchestras and bands. The Flint Institute of Arts offers exhibits of outstanding collections and many classes in the fine arts. Flint has an auditorium that seats 6,500 and a stadium that seats 17,000.
The Mott Foundation, endowed by Charles Stewart Mott, sponsors an unparalleled program for health and child welfare, and adult recreation and education. The Clara Elizabeth Fund established by the late William S. Knudsen is distinguished in the field of infant and maternal health.
Like many other fine cities in Outstate Michigan, Flint is served with electricity and gas by Consumers Power Company. This is indeed a place to go places. May we tell you more about it?
Check These Advantages of Outstate Michigan
★ Exceptionally High Percentage of Skilled Workers
★ In the Great Market Center of America
★ Wide Ranges of Materials, Parts and Supplies
★ Many Basic Materials Right at Hand
★ No State Income Tax ★ Desirable Plants and Plant Sites
★ Dependable Electric and Gas Service at Fair Rates
★ Excellent Living Conditions and Cultural Opportunities
★ Woods and Lakes that Make This a Foremost Vacation Area
*Shading on map shows territory served by Consumers Power Company
FOR FURTHER INFORMATION WRITE
Industrial Development Department
CONSUMERS POWER COMPANY
JACKSON, MICHIGAN
D-6-WSJ

This is a representative advertisement in the Consumers Power Co. series.

partment. This department is under the direction of Horace Brewer who has been associated with Consumers Power Co. for many years in purchasing and industrial matters.

The department works in close cooperation with the department of economic development of the state of Michigan and with local chambers of commerce and industrial organizations. Work is also carried on directly with industrial companies, engineering firms, banking institutions and others concerned with the location or expansion of industrial operations. The company also has available for the accomplishment of these development objectives, the facilities of its own engineering, land and other departments and of the service company which is employed for engineering and other functions.

Industrial expansion in the company's territory has been rapid in the past year and plants requiring many millions of cu. ft. of gas monthly and representing a diversity of operations are either now in production or under construction. It is expected that with the increase in defense and wartime work the demand for "ready-made" or existing plant facilities will continue to increase and will constitute an important part of the industrial development department work.

The company's national advertising is appearing this year in such publications as *Time, Newsweek, Nation's Business, The New York Times, The Wall Street Journal* and *Chicago Journal of Commerce*. In line with the objectives set forth by Mr. Whiting, the advertising goes beyond the usual conception of industrial advertising. Since January, and to continue for some time, each month's advertising features communities served by the company, setting forth the living, cultural, recreational and other advantages as well as what is offered industrially.

Present-day thinking in the industrial field, as related to external living conditions, as well as manufacturing requirements, has responded to this approach. At the same time there have been frequent expressions of local appreciation in the many cities thus far featured and in the territory as a whole because of the company's contribution to nationwide recognition of the communities and the growth and employment these messages seek to cultivate.

The company ties in the national advertising with local newspaper reproductions of the current advertisements. At the same time, copies of the advertisements are distributed to industrial and financial executives, civic and educational authorities, labor unions and other groups standing to benefit from this program.

As Mr. Whiting stated in his 1949 annual report to stockholders:

"Competition among the states for industries, new and old, has become acute. As one of America's leading industrial, resort and agricultural states, Michigan is a first-class place in which to live and work. We believe the territory we serve offers unusually good locations for industry."

Consumers Power Co. is backing this up with the work and material resources to make it a reality for the people of "Outstate Michigan."

Utility Librarians to Exhibit At AGA Convention

The Public Utilities Section of the Special Libraries Association, of which Miss Josephine I. Greenwood, librarian, Consolidated Edison Co. of New York, is chairman, has appointed an exhibit committee to arrange and operate a booth at the American Gas Association annual convention in Atlantic City, October 2-6. The booth will be located in the Atlantic City auditorium adjacent to the grand ballroom.

The Public Utilities Section of SLA is composed of librarians in the various public utility libraries or information centers. The purpose of the booth is to demonstrate the various services a library can render to member companies. A model library will be set up and operated, staffed by librarians, prepared to answer reference questions or give out other types of information. It will demonstrate to member companies how they can most efficiently and economically promote a fully informed staff by maintaining a central information center for the use of all departments.

An Explanation

The heading "Gas Distribution Systems Face Overload in Changeover Period," appeared over an article by Charles L. Fritz, of the Philadelphia Electric Co., in the July issue of AMERICAN GAS JOURNAL. *It has been pointed out that this might imply that the company is in the changeover period now. That is not the case, as Philadelphia Electric does not plan to convert until early summer, 1951.—The Editor.*

New Gas Discoveries Give Pennsylvania Renewed Importance in Eastern Supply

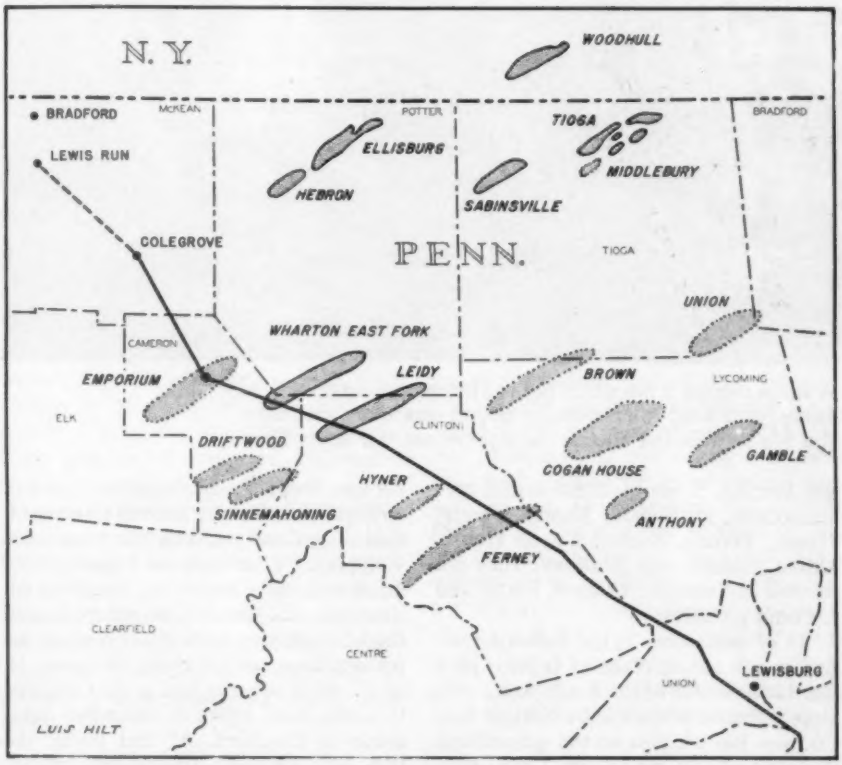
by Staff Correspondent

WITH six new gas wells brought in within the last few months in the Leidy field, and 22 additional ones now drilling in the north central Pennsylvania area, the state currently shows promise of reversing the trend in its natural gas production, which declined from 120 billion cubic feet in 1937 to 82 billion in 1949.

Between 1931 and 1939 many Oriskany sand fields were found in northern Pennsylvania and southern New York, some of which were: Hebron, South Ellisburg, Woodhall, Sabonsville, Middlebury, Palmer and Tioga. These are now, for the most part, depleted. At the time these fields were discovered, local geologists believed that similar structural sands were in existence in fields of comparable or greater size extending to the south. Inasmuch as there was an inadequate market for more gas in the 1930's, and no line pipe for construction during the war years, little exploration was carried on in these southern fields until late 1949.

The Wharton-East Fork field, which is the northernmost of the new fields, was the first drilled in 1935 by the North Penn Gas Co. The discovery well and following wells ranged between 5,000 and 6,500 feet in depth and drew gas from the Oriskany sand. It was interesting to note that this field, like the older fields to the north, contained shallow gas at 1200 to 1400 feet. Very little gas was taken out of the Wharton field until 1939, when Godfrey L. Cabot Co., Inc. drilled many wells, a part of which were on state land which the Cabot company had leased from the Commonwealth of Pennsylvania. After the war years the field was greatly exploited, and it is conservative to estimate that there has been over 25 billion cubic feet withdrawn from it to date.

The Cabot company is now taking from 20 to 30 million cubic feet daily from this field, selling it to United Natural Gas Co. and to North Penn Gas Co. In addition, the North Penn Gas Co. is pulling from its own wells, and there are many independents who are also delivering from this field.



Fields that may reverse the gas trend in Pennsylvania. Those in solid outline are already producing. The line is Trans-Penn Transit pipe line described in text.

In 1949, a group of townspeople in the small town of Renova, Pa., banded together and subscribed to stock in order to drill an exploratory gas well in the so-called Leidy field, which is about seven miles due southeast of the Wharton field. This well was begun about September 1949, but because of drilling difficulties, as well as financial difficulties, it was not completed until about the middle of January 1950. The well came in with great pressure and in such volume, that the gas "blew the tools," which lodged in the casing. Even with this impediment, the well produced 18 million cubic feet open flow. This discovery well, called the Leidy No. 1, is now selling between five and six million cubic feet of gas a day to the New York State Natural Gas Co.

As soon as the discovery well was brought in other producers interested in this area began leasing activities. Included in these were such large companies as New York State Natural Gas Co., Godfrey L. Cabot Inc., the United Natural Gas Co., the Standard Oil Co. of California, and many individuals or partnerships, such as Snee & Ebelry, Charles E. Fralich & Associates, and many others.

More wells were located and drilling begun. Inasmuch as the Oriskany was proved on this field, producers soon began to explore the adjoining gas domes in an effort to determine if they were also

A spark started a fire which burned for more than a week at Leidy No. 2 well. The picture on the left was taken soon after the fire started; the one on the right about two hours later.

gas bearing. Some of those domes are: Emporium, Driftwood, Sinnemahoning, Hyner, Ferney, Brown, Cogan House, Union, Gamble and Anthony. They are located in Cameron, Clinton, Potter and Lycoming Counties.

As of September 1, the following activities are taking place as regards pipe line facilities out of the Leidy field:

(1) The New York State Natural Gas Co. now has the pipe on the ground and the right-of-way cut for the laying of a 16-inch and 18-inch line from Leidy to the Sabinsville storage pool. This Sabinsville pool is in northern Pennsylvania, near the New York-Pennsylvania boundary. This line, upon the installation of adequate compressor stations, will have a daily throughput of approximately 100,000,000 cubic feet. It is expected to be completed November 1, 1950. In addition to this line, New York State Natural, in conjunction with the East Ohio Gas Co., has announced tentative plans to construct a large diameter line westward to the Ohio state line and thence to the city of Cleveland. Plans for this line are still in the preliminary stage.

(2) The Godfrey L. Cabot Co. is laying an 8-inch line from the Wharton field to the Leidy field. This line will be completed about October 15.

(3) A new company, the Trans-Penn Transit Corp., was formed early this spring. Trans-Penn has leased the 6-inch oil line from the National Transit Co. and will use this line for the transportation of natural gas. The line runs from Colgrove, Pa., in McKean County in the northwest, to Chester, in southeastern Pennsylvania. Gas will be pumped from the Leidy field in both directions. At the present time, an extension of some 16 or 17 miles is being laid from Colgrove to Lewis Run, which is about five miles south of Bradford. At that point, the line will intersect the Manufacturers Light & Heat lines running north. Gas from this line will be sold to Manufacturers Light and Heat at both Lewis Run in the north and in the vicinity of the small town of Lititz in southeastern Pennsylvania. Initial deliveries were scheduled to start October 1, 1950, but maximum throughput will not be reached until January 1, 1951.

(4) There are many rumors regarding various independents in this field forming pipe line companies in order to provide a market for the gas from the independent producers.

Extent of Activity

As of September 1, 1950, there are 22 wells, within a radius of 15 miles, either located, drilling or producing on the Leidy field. In addition, exploratory wells are now being drilled on the Hyner dome, the Emporium dome, the Ferney dome, and the Cogan House dome, and others. The Standard Oil Co. of California, in conjunction with a local producer, is drilling a deep hole test for oil. This well will be 13,000 to 15,000 feet deep, and is one of the first such wells to be drilled in this area.

Indicative of the extent of this Leidy field is the fact that the six producing wells came in at such great pressure and volume that it creates practically an entirely new era in gas production in Pennsylvania and almost the Appalachian area. Historically, other Oriskany sand fields in this general area have had relatively high pressures, but have been quickly depleted—first, because of maximum production, and in some cases overproduction—and second, because the fields were small. This Leidy field, as well as the adjoining fields, may react the same way, because the same economic and geological factors will be present. It is important to note, however, that the open flow on some of these wells has been greater than any wells ever drilled in the Appalachian area. In addition, geological information indicates that the Leidy and adjacent domes are much larger than those discovered in the thirties. For example, one of the wells brought in by the New York State Natural Gas Co. came in with an open flow of 50,000,000 cu. ft. per day, with a 4,200 pounds per square inch pressure.

The Leidy Prospecting Co., when bringing in its Leidy No. 2, was so unfortunate as to have the tools blown from the hole, creating a spark that set fire to the well. It took over a week to extinguish the fire, and then only through the able assistance of fire experts from Oklahoma and Texas. This well was recorded as producing 68 million cubic feet per day open flow, at pressure in excess of 4,500 pounds per square inch. This is said to be the highest pressure ever recorded on any well east of the Mississippi River.

Augments Long Distance Gas

The economic aspects of this new play in North Central Pennsylvania are quite important. Most of the Appalachian and eastern states are now dependent upon southwestern and Gulf Coast gas, but if this area proves able to produce, for instance, 200 to 300 million cubic feet of gas per day, for a period of five to ten, or perhaps 15 years, that amount of gas will be a most important addition to the long distance gas now coming from the southwest.

Inasmuch as Pennsylvania does not have a proration law, either as to acres per well location or production, it is entirely possible that the field will be overproduced from an economic or geological viewpoint. Producers who have pipe lines and markets will produce at their

(Continued on page 60)

Tests Show Interchangeability Ranges Are Best Determined by Experiment

by Hall M. Henry

Vice-president, Negea Service Corp., Cambridge, Mass.

MUCH testing and recently some fundamental research has been done on the interchangeability of gases, testifying to the importance of this subject, and more and more testing is being done and further research expenditures have been provided on interchangeability of gases, indicating that our knowledge is still short of a complete understanding of the subject.

With all of this testing and research we find few in the industry who will agree on what gas can and what gas cannot be interchanged with another gas or gases. We find such wide variations in statements as these:

High Btu oil-gas can be used 100 per cent as substitute for natural gas.

High Btu oil-gas can not be used to more than 50 per cent to 60 per cent with natural gas!

There are undoubtedly good reasons for the variations in the above statements. Any one or more of the following might account for this.

(1) A possible reason is the *degree of tolerance* from good to poor performance on the appliances that a gas *company is willing to accept.*

(2) It may also be due to the *kind of adjustment* that the service men make on the appliances.

(3) It can be due to the *nature of the appliances* on a company's lines.

(4) It may be due to the *chemical constituents in the gases.*

(5) The *relative proportions* of each constituent in the gases.

(6) *Btu input in relation to the rated input.*

(7) The tolerance in the Btu/cu. ft. air-gas mixture in the burner throat, before lifting or flash back occurs with one gas as compared with another influences the degree of interchangeability.

With all of these variables having an influence on the degree of interchangeability of gases, it is small wonder that we have so many conflicting statements on what can and what cannot be done on interchanging one gas with another. In the final analysis the only real measure of interchangeability is to try it out. There are, however, certain things that have been learned which will improve the interchangeability of a gas, and each company would do well to have these in mind in dealing with different gases. For instance:

(1) *Kind of Burner Affects Interchangeability*—It has been found that certain burners are more critical to a change in gas than another. For this reason a company should test a sufficient number of *different kinds* and *types* of burners to determine those that are critical. Having made this determination then a study of the *number* of such burners will show whether it is economical to modify or replace these critical burners. Much can be done to improve the degree of interchangeability by ferreting out these critical burners and appliances and by modifying or replacing them.

(2) *The Chemical Composition and the Relative Proportion in the Gases Affects the Interchangeability*—Studies at IGT and other laboratories have clearly shown that the degree of interchangeability is affected by the chemical composition of the gases. As an illustration, an oil gas by the addition of inerts is more interchangeable with natural gas. For instance, with a natural gas burner adjusted at medium ("O" on the rating scale of burner adjustments) through the addition of inerts to an oil gas the percentage of oil gas that can be satisfactorily used goes from 36 per cent to 82 per cent as shown in the following table.

	Unscrubbed Oil-Gas		
	10% Inerts	20% Inerts	30% Inerts
% Oil-gas can be used	36%	64%	82%

The chemical composition and hence the degree of interchangeability of an oil gas, for instance, will be affected by the method used in accomplishing the final gas. An oil gas obtained by dilution of inerts may not be as readily interchangeable with natural gas as one obtained by cracking since the chemical constituent and their proportion will be different in the two cases.

(3) *Type of Adjustment, i.e., Soft, Medium or Hard on Base Gas Affects the Degree of Interchangeability*—Many investigators have found that the nature of the appliance adjustment, i.e., whether soft, medium or hard, plays an important part in the extent that one gas can be added to or substituted for another gas. For instance, IGT found that an oil gas with the addition of 30 per cent inerts can only be mixed with natural gas to the extent of 25 per cent where burners are preadjusted on natural gas on soft side (— 2 on burner rating scale) but 82 per cent can be added where burners are preadjusted on natural gas at medium (0 on burner rating scale).

(4) *Relation of Btu Input on the Burner to the Rated Input Affects the Degree of Interchangeability*—Since the specific gravity of a base gas and an interchange gas may be substantially different, the Btu input on the base gas should be increased or decreased from the rated input of the burner depending on whether the sp. gr. of the base gas is higher or lower than the interchange gas. It is evident that if the *base* gas has a lower sp. gr. than the interchange gas, that for a given size orifice and gas pressure the input will be greater than when the interchange gas is substituted with its higher sp. gr.

(5) *Port Loading vs. Primary Air*—If the curves for flashback, blow-off and yellow tips are plotted on a graph having as coordinates primary air per cent versus port loading in thousands of Btu's per square inch of port area, it will

Presented at annual meeting, New Jersey Gas Ass'n, Sept. 8, 1950.

be found that the natural gas area included in these lines is relatively much greater than similar lines for oil gas.

Thus an adjustment on natural gas may lie outside of the oil gas curves, but usually an adjustment within the oil gas boundaries will fall within the natural gas boundaries.

Thus the variation in the type of gas on which burners are finally adjusted may lead to different conclusions unless the background is closely examined.

For example: A locality, where a substitute gas is frequently supplied, will ultimately have the appliances adjusted so that they are satisfactory for the substitute gas as well as for the base gas. Under these conditions it may be found that an increased percentage of substitute gas can be used.

The extent of substitutability may approach 100 per cent with certain gases.

(6) *Odors*—Where two gases have a different and pronounced odor, complaints of leaks (even though the degree of interchangeability is satisfactory) may arise when one gas is substituted for another. Hence by keeping the odors of the base gas and substitute gas as nearly alike as possible will improve the results.

A.G.A.—and Knoy Formula for Interchangeability—Formulas (which have been widely published) have been developed that may be used to determine the *probable* degree of interchangeability of two gases. One of the first formulas was developed by the AGA testing laboratory as a result of test work performed in 1926 on the interchangeability of gases having a heating value under 750 Btu/cu. ft. This original formula permitted the calculation of a "C" factor which was indicated to be a criterion of the limits for mixing gases. More recently another formula has been developed by the AGA laboratory that permits the calculation of indices which indicate the possibility of lifting flames, yellow flames and flash back when various high heating value supplemental gases are interchanged with natural gases.

Frank Knoy, chief technical engineer, Boston Consolidated Gas Co., developed what is known as the Knoy formula that permits the calculation of a Knoy "C" value. The formula was developed to select substitute gases for interchange with natural gas, but has been used for other gases. Interchangeability is said to be satisfactory if the calculated "C" values are about equal for the two gases.

These formulas are quite useful in determining the *probable behavior* of two gases. Experience has shown, however, that the calculated AGA indices factors on certain substitute gases have indicated lifting, flash back and yellow tip tendencies when *no* lifting was actually experienced and when more gas could be substituted before flash back occurred, and *no* yellow tips showed. Thus in the final analysis, the degree of interchangeability of two gases may only be determined by actually testing the gases on critical and noncritical appliances. Even the testing may be misleading unless the tester is familiar with the many factors which may affect the degree of interchangeability of the gases, and unless the *objective of the tests* is carefully established.

That which follows presents some of the tests that have been run to determine the degree of interchangeability of one gas with another and the conclusions drawn from these tests. There are also included some actual case histories of what certain companies have been able to do in providing substitute gases in case of failure of the regular gas supply. Mention is also made of the results of raising the heating value of gases to increase distribution capacities.

In the tests' reports that follow the AGA code for describing flame characteristics has been used. This code is given at the bottom of this page, center.

The combination of gases covered as to their interchangeability are:

(1) Increasing heating value from 528 Btu to 600 or 680 Btu.

(2) Amount and heating value of propane-air gas that may be used with:

528 Btu gas
660 " "
951 " oil gas
1000 to 1020 Btu natural gas

(3) Substitution of oil gas for natural gas.

(4) Substitution of natural gas for oil gas.

(5) Substitution of natural gas for propane-air gas.

(6) Substitution of propane-air gas for natural gas.

(7) Interchangeability of 660 Btu gas plus propane vapor with 951 Btu oil gas.

(8) Interchangeability of oil gas plus air with 528 Btu to 660 Btu carburetted water gas.

This is the first part of the paper Mr. Hall delivered at the annual meeting of the New Jersey Gas Association. Part 2 will be printed in the November issue of American Gas Journal.

Code	Flame Description
+5	Flames lifting from ports with no flame on 25% or more of the ports.
+4	Flames tend to lift from ports, but become stable after short period of operation.
+3	Short inner cones, flames may be noisy.
+2	Inner cones distinct and pointed.
+1	Inner cones and tips distinct.
0	Inner cones rounded, soft tips.
—1	Inner cones visible, very soft tips.
—2	Faint inner cones.
—3	Inner cones broken at top, lazy wavering flames.
—4	Slight yellow streaming in the outer mantles, or yellow fringes on tops of inner cones. Flames deposit no soot on impingement.
—5	Distinct yellow in outer mantles, or large volumes of luminous yellow tips on inner cones. Flames deposit soot on impingement.

Water Gas of 528 Btu vs 660 Btu

In the past three years a number of New England gas companies have raised the heating value of their gas from 528 to 620 or 660 Btu/cu. ft. Recently Philadelphia raised its heating value to 650 Btu/cu. ft. The Worcester Gas Light Co., which was the first NEGEA company to raise the heating value to 660 Btu, made a series of tests prior to going to 660 Btu to determine what changes would be required.

The result of these tests showed that all appliances (with the single exception of the gas refrigerator) which were not overgassed and which were in proper adjustment would perform satisfactorily on 660 Btu gas. Tests also showed that the gas refrigerators could be *readjusted* so that they would operate satisfactorily on either gas. Thus these two gases were found to be 100 per cent interchangeable after the refrigerator burners were modified and the appliances adjusted to proper Btu input rating. An analysis of the 528 Btu carburetted water gas and the 660 Btu gas follows:

	Gas Analysis	
	528 Btu	660 Btu
CO_2	5.6%	4.8%
Ill	8.6%	13.1%
O_2	.5%	.6%
CO	26.3%	24.3%
H_2	37.3%	24.6%
CH_4	9.9%	20.8%
N_2	11.8%	11.8%
Sp. gr.	.69 to .72	.71 to .73

The New England utilities in going

(Continued on page 57)

Reconditioning of Steel Gas Mains Protects Distribution Investment

Wayne H. Schultz
Morain Coating and Construction, Inc., Youngstown, Ohio

IN the field of corrosion of steel pipe lines, there are many problems which are gradually being solved by more fully analyzed studies and experiences with anaerobic, electrolytic, galvanic and other corrosion factors. To combat these obstacles, present day underground steel pipe is being protected with coatings and wrappings of varying specifications and in severe corrosive areas this protection has been augmented by the addition of cathodic protection to the pipe line.

Every pipe line installation is a major investment to utilities, and of course, this investment must be protected at all times.

Many pipe line installations of ten to 20 years ago were not afforded all the benefits of present day corrosion protection. An ailing pipe line can be rehabilitated by present day methods.

Unaccounted-for-gas caused by a leaking line is not only a loss in revenue to the utility, but in many cases a safety hazard. Both of these disturbing factors can be erased by turning old pipe lines into as good as new pipe lines in the following manner.

The utility companies that were instrumental in getting started in the reconditioning of their old steel pipe lines have spent considerable time in making various surveys to determine which pipe lines are giving, or will eventually give them trouble. Vegetation surveys, accumulated leak data, and the uncovering of pipe in soil that analysis proved corrosive where measurements of pits by pit gauge indicate the line must be reconditioned, or if the pipe is beyond the repairing stage, it must be replaced. Replacement is considered only when the cost of welding and/or patching exceeds the cost of installing new pipe. Because of what one might term the intricacies of steel pipe line reconditioning, most all gas utility companies, both large and small, prefer to have the reconditioning work performed by experienced contractors specializing in this field of work.

The first phase of a reconditioning operation is a complete pipe line survey by the contractor to determine the general over-all terrain conditions, the number of street or road crossings, railroad crossings, other underground utilities, etc. All this must be done to determine the types of equipment to be used, in order to arrive at a fair reconditioning price for the gas utility. Labor is another element to be considered, and this is covered by bringing in key operating personnel and the crew is augmented by the larger percentage of local labor. For operation in populated or heavy industrial areas, lighter equipment must be used.

Uncovering of the pipe line is done by either backhoe or trenching machine depending upon location of the line. Extreme care must be taken in digging-out operations, so that the pipe is not damaged or broken.

All service connections are, of course, hand excavated, and it is then that the utility service man disconnects the service and installs a flexible hose connection, in order that the pipe line may be raised or lowered at will.

A side boom tractor is usually employed to raise the pipe sufficiently to allow access to the underside of the pipe, and the raised pipe is then chained to over-the-ditch skids about every twenty to thirty feet.

In confined areas where service connections are quite prevalent, the cleaning is effected by use of several high speed electric buffing machines equipped with rotary wire cup brushes and specially designed pneumatic air tools. For straight-way or cross country work, a travelling cleaning machine is recommended.

After thorough cleaning, the pipe is inspected by the gas company inspector, and all pits and holes are marked for the electric welder. Usually all pits beyond 40 per cent depth of the pipe wall thickness are marked for pit welding. Of course, the original initial pipe wall thickness is the governing factor, and on the lighter walls, it is always safer to use a lower percentage yardstick on the depth of the pits. The welder fills all pits and where holes appear, the small ones are plugged and welded over, and the larger holes are covered with an asbestos gasket over which a steel leak clamp or steel plate is clamped, and the clamp or plate is then welded in place. Half sole plates are welded on areas where pits are concentrated. When it is found that a section of pipe has to be replaced, the gas supply is bypassed through a small line, while the new section is being installed.

After inspection, the pipe is then primed, coated and wrapped with the coating materials specified by the gas utility. Most of the coating and wraping work is usually done by hand, or in cases of cross country lines a travelling coating and wrapping machine can be

(Continued on page 64)

Atlantic City Gets Natural Gas

It Comes in Attractive Containers—Margaret Sue Sommers, of Dallas, presents a tank of compressed natural gas from Texas to "Texas Tessie," portrayed by Jane Wychgel, right, during Atlantic City's Miss America pageant. In the center is Hugh Wathen, sales manager for South Jersey Gas Co. It was the first natural gas to reach Atlantic City, although 18 million cu. ft. a day will be piped in later in the year.

Presented at 1950 spring meeting of Operating Section, American Gas Ass'n, Detroit.

Chicago Observes Gas Centennial By Dedicating Museum Exhibit

A 21 unit exhibit portraying America's gas industry was presented September 7 by The Peoples Gas Light and Coke Co. to the Museum of Science and Industry and was opened to the public as a permanent museum display, according to an announcement by Peoples Gas.

The $100,000 exhibit, entitled The Story of Flame Gas, was dedicated at a dinner held in the museum rotunda as an event of the observance of the centennial of Chicago's gas service.

Among the 380 guests present at the dinner were persons prominent in Chicago's business, civic, and professional life and a special committee of five gas utility executives including Hugh H. Cuthrell, AGA President; E. J. Boothby, President of the Washington Gas Light Co.; Robert W. Hendee, President of Colorado Interstate Gas Co.; Hudson W. Reed, President of the Philadelphia Gas Works Co.; and J French Robinson, President of the East Ohio Gas Co.

The principal speaker was Ralph Budd, retired President of the Burlington Line and now chairman of Chicago Transit Authority. In his speech, entitled "The Flame of Free Enterprise," Mr. Budd said, "From a single small plant which serviced 128 private customers in its first month of operation, the properties now devoted to public service have grown to a tremendous system for the production and distribution of gas, supplying close to a million residential and commercial customers every day."

James F. Oates, Jr., chairman of Peoples Gas, presented the exhibit to Major Lenox R. Lohr, museum President, who accepted on behalf of the museum trustees.

The dedication marks the 100th anniversary of continuous gas service in Chicago. Even the Chicago fire, which razed a large part of the city, failed to interrupt the service.

Chicago was only 13 years old when the gas was turned on in 1850, lighting 99 street lamps, 36 outlets in the city hall, and fixtures in 125 private establishments. By 1907 there were 13 separate gas companies—some operating in the same territories and duplicating facilities. Therefore, the companies combined to create an efficient city-wide system. Since then there has been only one company serving Chicago.

Chicago's per capita use of gas had risen 70 per cent in the 12 years before 1929, which necessitated the introduction of natural gas.

Peoples Gas now serves 7300 industrial and 35,400 commercial customers; in addition 8,300 commercial industrial customers rely on gas for space heating in Chicago.

James F. Oates, Jr., chairman of The Peoples Gas Light and Coke Co., severs ribbon in ceremony at exhibit entrance. Major Lenox R. Lohr, President of museum, looks on as 21-unit gas industry exhibit is dedicated as a principal event of the observance of centennial of gas service in Chicago.

Extensive Field Tests Started On Automatic Ignition

A special series of nationwide field tests have been started to help accelerate development of automatic ignition devices for gas ranges. Some 49 utility companies, 16 gas range manufacturers, and six control manufacturers are participating in the project under the American Gas Association's PAR program.

Close cooperation between utilities, manufacturers and AGA in the test program is expected to result in a marked advance for the development of a gas range which will consume little or no energy when not in use. Eleven different types of automatic range ignition systems, seven electric and four single-point gas, will be tested under actual operating conditions. A total of 200 automatic gas ranges will be equipped with each type of ignition or a grand total of 2,200 ranges.

According to H. H. Cuthrell, President, AGA, and chairman of the special committee on automatic range ignition development which is supervising the project, the tests will be conducted for a minimum period of six months. The various range ignition systems will be operated under normal home conditions. Cooperating utilities will complete monthly and special report forms which will be forwarded to AGA laboratories for processing and analysis. R. J. Rutherford, President, Worcester Gas Light Co. is chairman of the working committee supervising details of the field tests.

The project climaxes several years of industry research on single-point ignition and is expected to be the most extensive field study of gas appliances ever undertaken.

Montana Power Now Asks for Canadian Gas

A recent development serves further to becloud prospects for at least one of the pipe line ventures proposing to export natural gas from the Canadian Province of Alberta to the Pacific Northwestern states of Oregon and Washington.

This is the contract consummated by Montana Power Co. to purchase from McColl Frontenac Oil Co. and Union Oil Co. the Lake Pakowki gas field in southeastern Alberta. Reserves in this field are estimated at about 350 billion cubic feet.

Montana Power urgently needs this gas to take care of expanding service requirements of its territory and to supplement its present takings from the Cut Bank field in northern Montana.

Montana Power has applied to the Gas Conservation Board in Alberta for a permit to export gas from the Lake Pakowki field. This raises two very important points—(1) whether Montana Power will obtain the export permit which it so seriously needs and (2) who, if anyone, will be adversely affected if the permit is granted.

Local demands on the gas systems operating in Alberta are expanding at a rate far faster than anticipated earlier. As a result, the weight of evidence indicates that the Alberta Conservation Board may conclude that the Province does not have any surplus gas supplies above those required to meet its own needs.

Such a decision would put a serious crimp in the efforts of Montana Power Co. to obtain gas supply relief from the Dominion.

If this were not enough of an obstacle, it might be mentioned that the wholly intra-Canadian Alberta to Winnipeg gas line proposed by Western Pipe Lines—which is believed to have top priority in

(Continued on page 57)

Gas Heating

A REPORT TO THE GAS INDUSTRY ON G-E GAS HOME HEATING EQUIPMENT

General Electric has been manufacturing gas home heating equipment for more than fifteen years. G-E Gas Furnaces and Boilers have been installed in thousands upon thousands of homes throughout the country, and have earned an enviable reputation for quality and performance. Today the acceptance of G-E Gas Heating Equipment with builders and home owners is greater than ever before. Because of the demand for G-E equipment, orders for G-E Gas Heating Units are considerably ahead of present high production.

Look At This Record Of Builder Acceptance

In addition to individual installations, outstanding have been mass installations of G-E Gas Furnaces and Boilers in developments all over the country. Typical examples: Daly City, California—563; Detroit, Michigan—350; Ridgefield Park, New Jersey—850; Secane, Pennsylvania—188. *Builders know that the G-E name on Gas Heating Equipment helps sell houses, because* NO OTHER BRAND NAME IN AMERICA IS MORE HIGHLY REGARDED.

Distribution

Over 700 G-E Sales Outlets are ready to help utilities promote the automatic gas house heating business.

Backed By Intensive Promotion

G-E Gas Heating Equipment is promoted on a national basis with advertisements in *The Saturday Evening Post* and other national media. On the local level, builders are featuring G-E Gas Heating Equipment in their advertising to help sell their houses. Direct mail advertising and other forms of sales promotional activity are included in a well-rounded program to sell G-E Gas Heating.

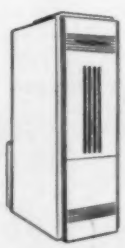
Product Development

G-E research helps build the gas load. G-E *Air-Wall* Heating, the exciting new development in the warm air field, has dramatically boosted the sales of G-E Gas Warm Air Heating Systems. Combining in one system forced warm air plus radiant heat, G-E *Air-Wall* Heating was an immediate success when it was introduced a year ago. Newest development in G-E *Air-Wall* Heating is the G-E Automatic *Air-Wall* Register, which now provides automatic *individual room temperature control.* Manual balancing of the system is gone forever! No more under or overheating! Regardless of temperature variations due to the sun, wind, cooking or fireplace—day or night—the Automatic *Air-Wall* Register compensates for these changes.

In G-E Gas Furnaces and Boilers — remember this — there is *single responsibility*. G. E. stands behind *all* of its gas home heating equipment.

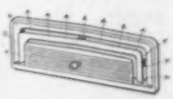
GENERAL ELECTRIC COMPANY
Air Conditioning Department, Bloomfield, N. J.

You are cordially invited to visit the G-E Gas Heating Exhibit, **Booths 618-619** *A.G.A. Convention • Oct. 2–6, Atlantic City, N. J.*

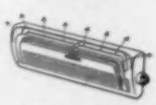


G-E Gas Warm Air Furnaces. 5 models—60,000 to 210,000 B.t.u. input per hour

G-E Gas Boilers. 8 models—96,000 to 432,000 B.t.u. input per hour



G-E Standard AIR-WALL REGISTER



G-E Automatic AIR-WALL REGISTER

You can put your confidence in—

GENERAL ELECTRIC

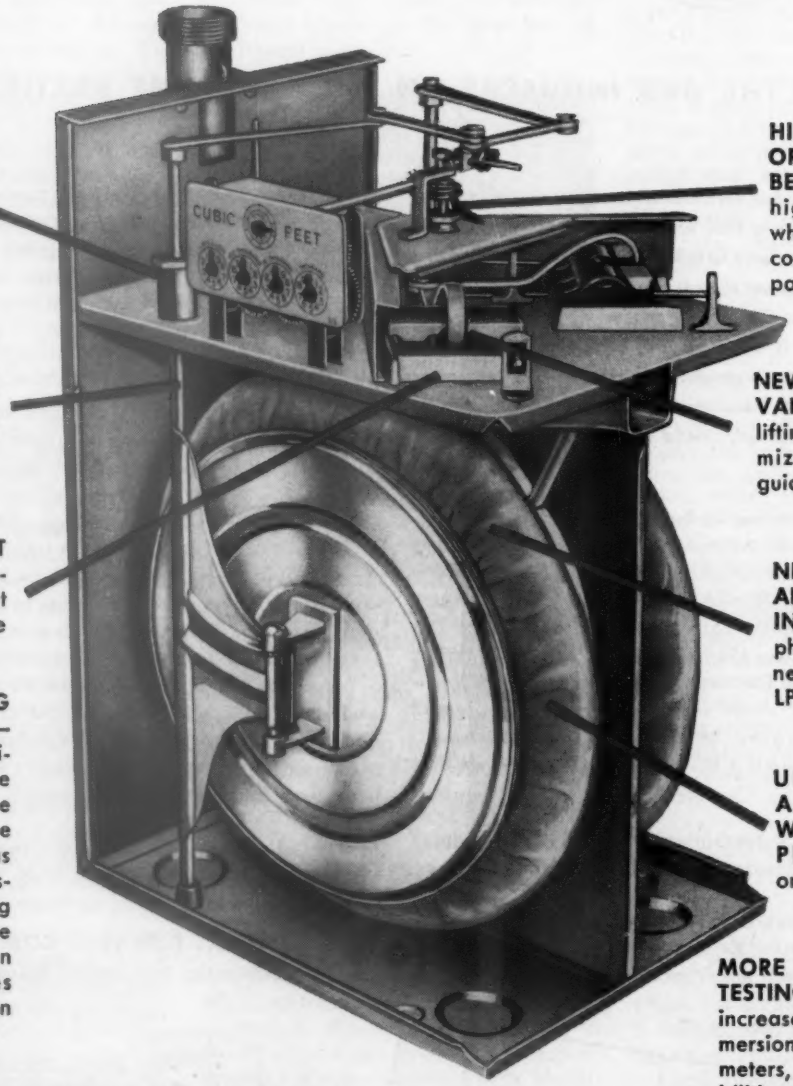
TODAY'S IMPROVEMENTS

UNIFORM FELT WASHERS with better heat and solvent resistant dressings improve accuracy in service.

LARGER FLAG ROD DIAMETERS minimize torsional deflection and maintain accuracy at high capacity rates.

CAST-IN VALVE SEAT ASSEMBLY automatically insures correct crank bearing and valve seat assembly.

SELF-LUBRICATING BRONZE BEARINGS — Twelve years of experience with large Ironcase Meters have proven the superiority of this type bearing material for gas meter use. The necessary tooling is now being installed to manufacture this advance design bearing for all types and sizes of American Meters.



HIGH DUTY BRONZE OR BRONZE-BUSHED BEARINGS furnished in high capacity meters wherever they run semi-continuously at near capacity rates.

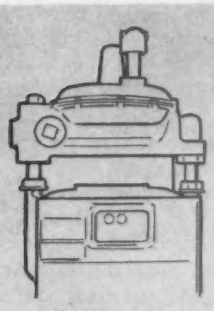
NEW SMOOTH SLIDING VALVE DESIGN reduces lifting or tilting, thus minimizing chattering and guide wire slap. *

NEW MOLD, MILDEW AND GUM INHIBITING ADDITIVES to diaphragm dressing meet needs of Manufactured, LP and Natural Gas.

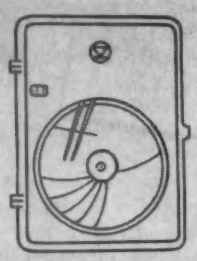
UNIFORMLY CUT AND MACHINE-WOUND DIAPHRAGMS are used on all production sizes.

MORE RIGID IMMERSION TESTING PROCEDURE using increased pressures and immersion tanks for large-sized meters, further reduces possibilities of leaks.

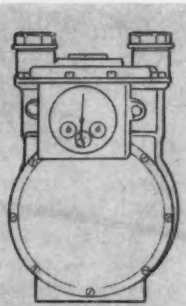
*NOW AVAILABLE IN 5M AND 10M METERS.



METER BAR REGULATORS



REMOTE INDICATING AND INTEGRATING ORIFICE METERS
(Bulletin EG-2)



DRY TEST METERS
(Bulletin AG-3)

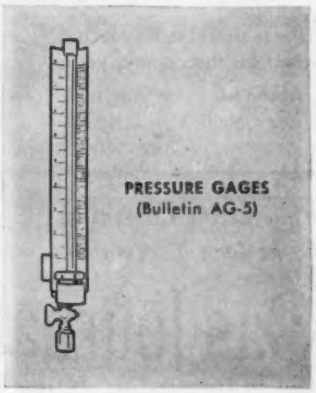
TO MEET TOMORROW'S NEEDS

FOR more than 114 years, American Meter Company has maintained an engineering research program covering the design, materials, manufacturing methods and testing of meters as well as meter maintenance and performance records in the field.

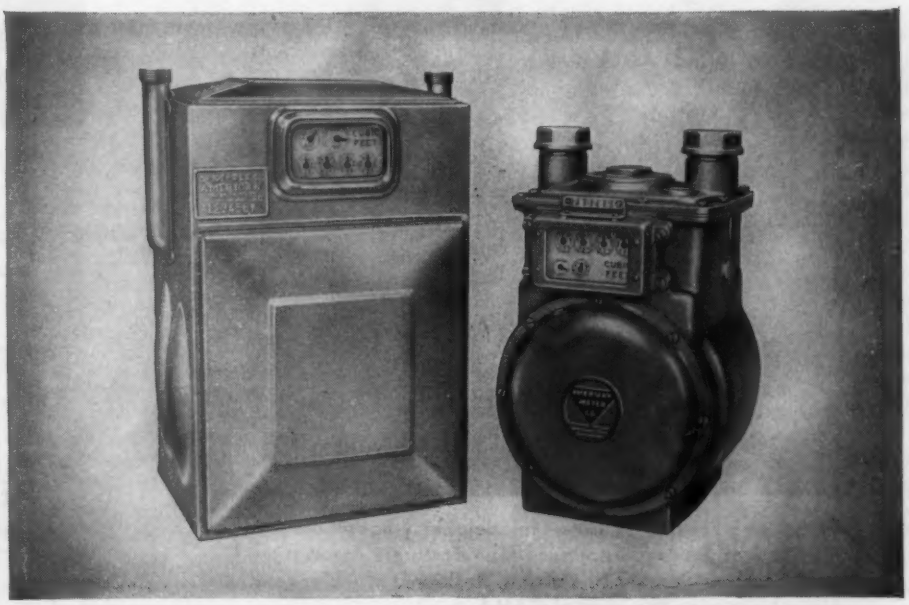
One of the newest developments of this constant research and testing is the 5M/300 Displacement Meter with smooth-sliding valve covers illustrated on the opposite page. The improvements which are embodied in this model, effectively meet the capacity requirements imposed by imminent increases in domestic requirements resulting from changeover to natural gas. It is typical of the many "firsts" in meter improvements which over the years have established the American Meter Company tradition of "*sustained accuracy at lower cost.*"

AMERICAN METER COMPANY
INCORPORATED (ESTABLISHED 1836)

60 East 42nd Street • New York 17, N. Y. • Albany • Alhambra • Atlanta • Baltimore • Birmingham
Boston • Chicago • Dallas • Denver • Erie • Fort Lauderdale • Houston • Joliet • Kansas City • Los Angeles
Minneapolis • Odessa • Philadelphia • Pittsburgh • San Francisco • Tulsa
In Canada—Canadian Meter Co., Ltd., Hamilton, Ontario



PRESSURE GAGES
(Bulletin AG-5)



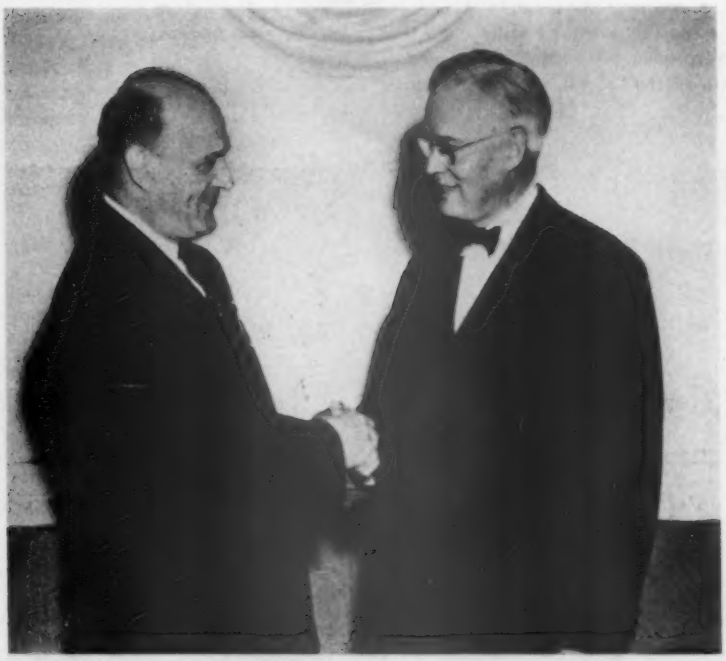
THEY FACE THE FUTURE

With Confidence and Good Cheer

Important Figures at Annual Convention Of American Gas Ass'n at Atlantic City

Hugh H. Cuthrell, Brooklyn, N. Y., is President of American Gas Association.

D. A. Hulcy, Dallas, Texas, is vice-president of the Association and is slated to be elected President for the coming year.



At the left is Frederic O. Hess, Philadelphia, who will become President of the Gas Appliance Manufacturers Association. At the right is Stanley H. Hobson, Rockford, Ill., who completes his term as President of GAMA.

While at the Convention
Be Sure To Visit

AMERICAN Gas Journal

At Booth 204

Utilities Have the Vital Responsibility To Upgrade Heating Installations

by H. W. Milner

H. W. Milner

IF all pieces of gas heating equipment were equally effective, equally efficient and performed an equal service to the customer, the gas utility would have no interest at all in the recommendation of brand or the type of the equipment.

This fundamental fact has led many utility companies to adopt a somewhat categorical attitude toward the recommendation of equipment. If one wishes to analyze the situation carefully, it does not take long to come to the conclusion that utilities have the most to gain of any element in the gas industry in seeing that good heating equipment, which will give proper service to customers, is installed on their lines.

The manufacturers of gas equipment, of course, have a lot at stake in seeing that their equipment is adequate and well received. On the other hand, no one in the manufacturing business is necessarily tied to the manufacture of gas equipment since, in many instances, they are also involved in the manufacture of equipment using competitive fuels.

Utilities are inescapably obligated to render good service to their customers. Therefore, it is more important to them than any other element in the gas industry that correct equipment is properly installed and will operate to everyone's satisfaction.

It so happens that the gas industry is entering upon an era which is unique in many respects. Natural gas is being introduced in large areas in this country. Secondly, we are entering a war economy. No one knows exactly what this economy will be or what form it will take. But, from the utility standpoint the *best* objective is that—whatever gas equipment is permitted to be manufactured and sold and does the *best* job for the consumer—will ultimately mean the best for the industry as a whole.

Gas is a premium fuel by its very nature. It cannot be otherwise; the direct advantages in cleanliness, comfort, convenience and lesser service greatly outweigh the added initial cost. But, certain temporary conditions, which may be somewhat related to regulatory processes, may produce an artificial condition and gas becomes the cheapest fuel per Btu which can be obtained by customers. The distribution of gas by its nature must be a regulated monopoly and as such is not subject to the varying changes of price of other fuels. In many respects this is an unfortunate situation because it tends to promote the use of gas for purposes for which it is fundamentally not suited, and for which no assurance can be made over a long period that it will continue to be the fuel used.

From the standpoint of the utility this is a great hazard because the utility must provide capital equipment to serve a load of this kind which, if not permanent, results in unused capacity. Therefore, it is desirable, if not mandatory, for the utilities to take a firm hand in guiding the destiny of the appliances which utilize the fuel they sell.

Six Important Factors

No one in the industry should ever forget the following salient points:

1. Gas is the only fuel economically suited to heating loads that can be utilized efficiently in small pieces of heating equipment.
2. All of the products of gas combustion are in themselves gaseous and can be easily disposed of with their own energy if proper venting is assured.
3. Gas is the only form of energy in this category which does not require storage space or effort on the part of the consumer to assure its adequate supply.
4. Fortunately, or unfortunately, in the public mind the benefits of natural gas in an area are largely related to the fact that houses may be heated adequately and economically by its use.
5. As the house heating use goes, so goes the rest of the domestic consumption.
6. The ability to supply house heating by a utility at rates which consumers are willing and able to pay, and at the same time are fully compensatory, is dependent entirely on the type, efficiency and design of equipment which is installed.

Protect the Customer

Therefore, it is of the utmost concern to serving utilities to recommend, endorse or influence the type of equipment which will be installed on their lines. Most certainly, any utility which does not have the right to prohibit the use of equipment which may constitute a hazard or deprive other customers of the utility's product should be given such rights and required to use them.

These facts are obvious. Yet, the American propensity to "take a chance" has been, to quite an extent, responsible for building up the highest standard of living which the world has ever seen. So, while we may write codes and rules from now to doomsday, we must always keep in mind that we are living in a progressive age which precludes thinking along lines of a "finished economy." All rules are subject to amendment, and our codes, while definite, must be likewise subject to amendment as new methods of using gas are brought to light, and new developments in housing make old methods obsolete and even dangerous.

The policies of endorsement of over a thousand utility companies serving nine thousand communities with all types of gas cannot be clearly defined in an article of this length, but we may be able to glean a thought that can be of benefit to the utility and its customer.

The very first requirement for utility endorsement of an appliance should be approval by the American Gas Association Laboratories. Not that this means perfection, but it does mean that basically the appliance is sound. The AGA laboratory seal has built an enviable reputation in the last quarter century, and

we must continue to guard this reputation. So, except for test purposes, utilities should refuse to recommend other than appliances which bear this approval. Note that we did not say the AGA approval is tantamount to utility approval. Appliances are approved for certain conditions. If these are the conditions common to the utility territory, well and good. It is not the obligation of AGA to police the application of the appliance.

In most cases it is well that a live code be put into effect with enforcement in the hands of civic authorities. A gas utility, by nature of its operation, is a monopoly and the American public does not like to be governed by even supervised monopolies, so let the municipal authorities pass and enforce the codes on heating just as they do on plumbing. By a live code, we mean one that is not too difficult to amend and is subject to revision at stated intervals. Don't let your municipal codes become "Laws of the Medes and Persians which change not."

Conversion Burner Leads

It is customary, when natural gas is introduced in a territory, that the bulk of the immediate business is in conversion burners, and a good conversion burner, properly installed in an efficient heating plant can be nearly as economical as a gas designed heating plant. Often, however, this is not the case; burners are poorly installed in inferior and inefficient furnaces, sold by unscrupulous dealers as a cure-all, with a resultant epidemic of complaints, attendant poor publicity, removals that are costly to consumer and utility alike.

Confidence in the gas supply must be built up, and the conversion burner is the fastest load builder. But, give yourself a break. Never install a burner without recommending an improvement in the home from a heating standpoint. Insulation, weatherstripping, storm sash, are all important in the order named, and will help keep the burner sold until confidence in the gas supply will be built to the point of logical replacement of the old heating equipment. And, make sure that in this age of gadgeting at least one or two rooms can be heated by gravity, independent of the central plant. It is most embarrassing to have no heat on account of a power failure.

Do not overlook the modern trend toward zone heating. Zoned heating with its highly desirable features is today's answer to those home owners who want the best in heating at the greatest possible savings in fuel consumption. This is possible by separate thermostat control in different rooms. Daytime living quarters, such as living room, study, or sun parlor, can be carried at one temperature while bedrooms are maintained at another. Properly installed zone heating in apartment houses provides each tenant with his own room thermostat. The fact that every apartment is separately heated and individually controlled insures each family its special comfort condition and guards against wasteful gas consumption. Further, the gas used by each tenant can be separately metered. The flexibility of zone heating is both modern and economical.

Keep your brands of equipment as few as possible. In this way you can cull the list to those manufacturers who are able and willing to serve your customers, and each one will have enough of an interest in your business to help take care of it. Do not serve equipment which is vented to a masonry chimney which has any entire side exposed to the weather or an unheated space. This is a cold flue, and with thermostat control will cause undue draft diverter spillage, sufficient at times to make the house sweat.

Be honest with your cooperative dealers. Set the qualifications high and maintain them. That will automatically reduce their number.

Unfortunately, even the best equipment is only as good as its installation. In most instances it is not possible for the manufacturer to prescribe how the equipment should be installed in relationship to the building nor can he control the method in which it is vented except by continually upgrading the type of dealer handling his equipment.

The utility should also be everlastingly alert not only in upgrading dealers but also manufacturers, as frequently a manufacturer is prone to close his eyes to the faults of his equipment as used by the public, and is inclined to continue the manufacture of a product without regard to its use as long as the market absorbs it. There seems to be little co-ordinated effort on the part of appliance manufacturers in obtaining the same objectives as those sought by the utilities. A concerted policy of policing or recommending of higher quality equipment will help correct any inertia in the manufacturing group.

Please, Vent!

Frown on the use of unvented equipment. True, gas is a vapor and a clean one, but it is also a fuel. Its products of combustion contain large quantities of water vapor which can do no harm while in the vapor state, but when brought in contact with surfaces of a temperature below the dewpoint of the vapor, resultant condensate can do much damage. The main trouble is that the water vapor existing in gas flue products is quite well known and is blamed for conditions for which it is not responsible.

Recent investigations by Purdue University (Research Series No. 106 Engineering Bulletin, Purdue University—Research in Home Humidity Control) bring out the fact that from 25 to 55 pounds of water vapor per day can be released in an ordinary home by normal housekeeping procedures aside from heating. This is far more than sufficient to cause troublesome condensation in severe weather so make sure that the vapor products of gas combustion do not contribute to this nuisance.

This brings up the subject of venting, which was discussed at length in these pages* last year. A utility which is just starting to use natural gas is, in many respects, in an enviable position. It has the vast experience of the industry on which to draw. Do so. Profit from the bitter lessons which have been learned by utility after utility in the early years.

The products of complete combustion of natural gas are invisible, odorless and in themselves, harmless. This has in the past tempted the industry to use unvented heaters in their load building programs. Times have certainly changed. Gas is in demand. Gas can now be sold with its use hedged about by safeguards, which in former days would have been prohibitive. At the risk of being redundant, we will repeat some of the basic rules for venting gas appliances.

Rule No. 1

The first rule is one which is most important and has in the past been most ignored. It is this. "Use existing flues enclosed in masonry chimneys only when *all* the following requirements are met; (1) Chimneys must extend from grade to a point at least two feet above the highest portion of any construction within 15 feet of the chimney and (2) must not have the entire length of any side exposed to the weather or an unheated space such as a garage. (3) Flue lining must be without offsets and extend at least one foot below vent connection with a clean-out door at the base. (4) Flue must have effective cross-sectional area equal to the combined effective cross sectional areas of all vents connected thereto. (5) Flue linings shall have vent openings from only one floor level."

Water heaters must not, and unvented room heaters should not, ever be installed in bathrooms or bedrooms. The importance of this can be better appreciated when we examine the regulations in effect in various parts of the country relative to the use of gas. Some of the regulations were put into effect by state

(Continued on page 62)

* See series of four articles by C. H. Dean in American Gas Journal—July, August, September and October, 1949.

Simple Instrument Test Determines Effect of New Load on Laterals

by William M. Smith

Sales Engineer, Selas Corporation of America

POSITIVE determination of the volume of gas that can be supplied to new industrial customers is a routine procedure of the distribution divisions of Public Service Electric and Gas Company, when there is even a possibility of impairing the service to nearby established customers.

The delivery tests are made in a few minutes, after preparations have been completed, with a flow rate-indicating "Flo-Scope" and three pressure-drop gauges.

In a typical application for new industrial service, the adjacent main capacities were known to be equal to delivering the volume requested by the customer, a heat-treating establishment. There was some doubt that the street lateral could carry the volume without showing pressure drops at adjacent plants. Accordingly, the delivery test was necessary.

The usual opening was made for connection to the street lateral and the gate valve was installed.

The Selas "Flo-Scope" is equipped permanently with pipe and fittings that are used in these tests. The only variable is the length of pipe that connects the gate valve to the bottom elbow on the "Flo-Scope" set up.

The vent from the "Flo-Scope" has been equipped with a butterfly valve to limit the actual gas loss to the short period of the test.

One of the three pressure drop gauges was inserted ahead of the "Flo-Scope." The other gauges were inserted at the plants of the adjacent customers on either side of the new service.

When all preparations were completed, men were stationed in the adjacent plants to read the pressure gauges during the test period. Other men were in the street to relay the signals originating at the "Flo-Scope" set-up.

The actual test followed this sequence: Butterfly valve was kept closed until the gate valve was wide open . . . start of the test was signalled to the men reading the gauges at the adjacent plants . . . butterfly valve on the vent was opened . . . wide open flow rate was read and recorded from the scale of the "Flo-

Fig. 1—Public Service engineer reading the indicator during the test. At this point, the rate of flow was 5,000 cu. ft. per hour. The man in the opening operates the gate valve to limit the loss of gas to actual test period.

Fig. 2—Connection of the test equipment to the service gate-valve. The short pipe length from valve to elbow is the only variable piece of equipment, from test to test.

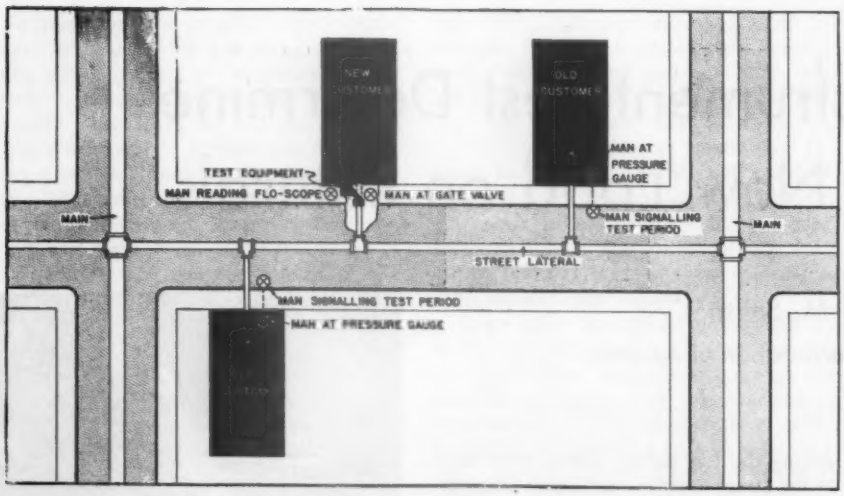


Fig. 3—Street diagram of the gas availability test.

Scope" . . . pressure drops were noted, at the test point and at the adjacent plants . . . butterfly was closed slowly until the maximum permissible pressure drop was reached . . . the corresponding flow rate was read from the "Flo-Scope" indicator.

That last figure, in cubic feet per hour, determined the extent to which the application for service could be met without impairing the nearby service. In this typical case, with very adequate volume in nearby mains, the street lateral capacity will be increased to meet fully the new request for service.

The "Flo-Scope" test for gas availability to new industrial customers is used only when there is any doubt about the effect of the new load on the existing service. Ten years' experience has proved the accuracy of the determinations made during these tests.

New Jersey Gas Ass'n Has 35th Convention With 300 in Attendance

R. H. Phillips, Jr.

R. H. Phillips, Jr., Public Service Electric and Gas Co., Newark, stepped into the presidency of the New Jersey Gas Association as a result of the election held at that organization's thirty-fifth annual convention on September 8, at Spring Lake, N. J.

With him on the ticket to guide the association's affairs for the coming year are: H. D. Polhemus, Jersey Central Power and Light Co., Asbury Park, 1st vice-president; Vernon F. Stanton, South Jersey Gas Co., Atlantic City, 2nd vice-president; and E. A. Smith, Newark, re-elected secretary-treasurer.

Topics considered in the one day session, which attracted a total registration of more than 300, fell under general headings of sales, utilization, production and management policies with competent speakers assigned to specific subjects under each.

A paper by J. P. Leinroth, Newark, read in his absence, due to illness, by Harry A. Sutton, covered in analytical detail the position of the sales departments of the gas utilities as the country returns to its wartime economy. The gist of the speaker's remarks: Although it is apparent that we are moving into a period of scarcity, the degree of which cannot presently be appraised, the gas utilities cannot afford to relax their selling efforts, particularly in such fields as commercial utilization where competition remains as keen as ever. He advocated the adoption of policies that would encourage and increase the number of aggressive independent gas appliance dealers.

Robin D. McNeice, Newark, presented a paper on the conversion of gas appliances from manufactured to mixed gases. His dissertation dwelt largely with the experiences of Public Service Electric and Gas Company in pre-testing various types of equipment prior to changeover. A series of excellent color slides amplified and clarified his remarks.

Hall M. Henry, Cambridge, Mass., displayed charts and figures summarizing his studies on the interchangeability of gases. Drawing on the experiments and observations made in several companies of the NEGEA system, the speaker observed that under certain conditions gas can be stepped up from 528 Btu to 660 Btu without a program of complete appliance adjustment, providing always that the appliances were in adjustment in the first place.

The first part of Mr. Henry's paper appears on page 27 of this issue of AMERICAN GAS JOURNAL.

Speakers delving into the somewhat less tangible fields of personnel management procedures, public relations and the state of the union, included G. Edward Pendray, New York; Arthur Secord, Brooklyn, and Rob Roy Macleod, Buffalo.

FPC Approves Plan for More Gas For Nashville Area

Tennessee Natural Gas Lines, Inc., of Nashville, Tenn., has received Federal Power Commission authorization to expand its pipe line facilities in order to increase natural gas deliveries to Nashville Gas and Heating Co.

The additional deliveries will also enable Nashville Gas to provide natural gas service to Madison, Amqui, Rayon City, O!d Hickory and Du Pontonia, Tenn., all presently without any gas service, and to provide interruptible gas service to one direct industrial customer, a plant of the E. I. Du Pont de Nemours Co., near Old Hickory.

Tennessee Natural's proposed project, estimated to cost $775,720, will include approximately 24 miles of pipe. The additional facilities will increase the company's delivery capacity, now approximately 28 million cu. ft. per day, to more than 41 million cu. ft. daily.

More Compressor Horsepower Granted to Texas Gas

Texas Gas Transmission Corp., of Owensboro, Ky., has been granted temporary authorization by the Federal Power Commission to install and operate 9,960 hp in compressor capacity at existing and new stations on its pipe line system in order to transport additional quantities of natural gas for Texas Eastern Transmission of Shreveport.

The Commission concurrently granted temporary authorization to Texas Eastern to sell and deliver additional volumes of natural gas to its existing customers west of compressor station No. 20, which is located in southwestern Pennsylvania.

The Texas Gas construction program includes installation of 5,460 additional hp at four stations in Tennessee and Kentucky, and construction of a new 4,500 hp station in Kentucky. Estimated cost of the project is $2,108,887.

Texas Gas will use the additional capacity to transport for Texas Eastern to 60 million cu. ft. of natural gas per day for one year and to 34 million cu. ft. per day the following year.

Hydrocarbons Are Reformed at Two Plants Of Long Island Lighting Co.

S. W. Horsfield

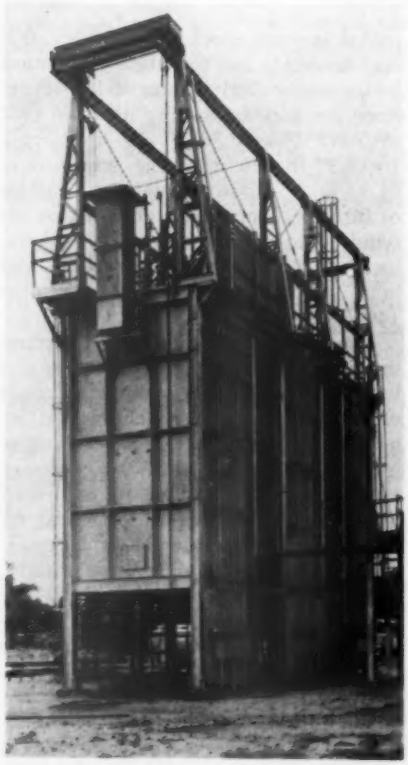
Long Island Lighting Co., Garden City, N. Y.

EXPERIENCE has been gained in the reforming of hydrocarbons at two plants of the Long Island Lighting System. At Hempstead, which is a light oil carburetted water gas plant, advantage was taken of low summer butane prices by replacing gas oil with butane reforming and cold enriching. At Riverhead, butane and propane have been reformed catalytically to produce a completely interchangeable gas for peak load shaving during the winter months.

The availability of low cost butane during the summer months, and the fact that liquified petroleum gas storage and vaporizing equipment were available at the Hempstead Works indicated that the use of butane in place of gas oil at this plant would be an attractive proposition provided that the amount of additional investment required was not excessive. Investment cost was important as it is expected that with the advent of natural gas, operations at this plant will be drastically curtailed.

It was decided that the minimum of equipment be installed to enable the butane operation to be thoroughly tested, with the idea of improving these facilities if the results and future demand for production at Hempstead warranted such a course. Consequently, the No. 3 11'-0" water gas machine was selected, it being located near the existing liquified petroleum gas equipment, and connections were made to utilize the existing LP-g vaporizers of this equipment. For safety reasons, vapor in preference to liquid was piped to the generator house, and the necessary connections, valves and controls were installed to permit the introduction of the butane vapor for reforming during both the up and the back run of the No. 3 water gas machine.

Minor changes were made to the existing vapor and heating-value control equipment of the LP-air plant to permit using this equipment for supplying the butane required for cold enrichment direct to the storage holder, thereby bypassing the carburetted water gas equipment entirely. This was not considered to be ideal but it involved the minimum expense for new equipment. Operation later proved that while some cyclic variation of the heating value of the gas was evident on account of the cyclic operation of the gas machine and the continuous operation of the cold enrichment injection, this was not excessive as the mixing of the gas in the storage holder tended to nullify these variations.



The Catalytic Gas Plant of the L. I. Lighting Co., Riverhead.

While this mixing operation was satisfactory, it is recommended that if butane is to be used extensively, the enriching gas should be introduced at the inlet to the purifiers. This would provide more automatic and reliable control and better mixing.

The equipment installed consisted of a six-inch vapor line running from the vaporizer room to the generator house, shut-off valves, flow meter, control valves connected to the automatic control, and connections to the set to permit butane vapor to be introduced during the up and back run portions of the cycle. The total investment cost was approximately $5,000.

Operations were started using butane during both the up and back runs, but this was found to be somewhat hazardous on account of the inability to purge the back-run line properly without the installation of considerable additional equipment. It was, therefore, decided to introduce the butane only on the back run and change the sequence of runs in the cycle, putting the back run early in the cycle to take advantage of the better fire conditions. The cycle which was of four minutes' duration was as follows:

Gas Machine Cycle

	% of Cycle	
Blow	8	
Blow Run	14	
Up Run	4	
Back Run	51	(Butane 45)
Up Run	20	
Purge	3	
	100%	

The results obtained by this operation compared with those obtained under normal operation using gas oil are shown in the table on page 40.

The production capacity of the set was limited by the amount of butane that could be injected with the equipment installed. This is of no consequence during the summer, as the base load gas was made at other plants using heavy oil. However, we are of the opinion that with proper equipment the capacity could be increased at least 20 per cent.

No unusual difficulties were encountered. The wash-box water was clean and free of carbon and tar. Some hard-

Presented at meeting of Operating Section, American Gas Association, New York, May 1950.

	Butane Operation		Gas Oil Operation	
Make per hour	195 Mcf		197 Mcf	
Materials Used	Quant./M	Cost c./M	Quant./M	Cost c./M
Coke	7.65 lbs.	7.29	23.57 lbs.	22.45
Gas Oil	—	—	3.38 gals.	29.20
Butane (Reformed)	3.68 gals.	22.08	—	—
Butane (Enriching)	2.02 gals.	12.12	—	—
Tar (Credit)	—	—	.63 gal.	(5.36)
Total Materials Cost		41.49		46.29

Total Savings in Cost of Materials 4.8c./Mcf.
Unit Cost of Materials (delivered): Coke $19.05 per ton, Gas Oil 8.64c. per gallon, Butane 6.0c. per gallon.

ening or drying out of previous tar accumulations in the foul main was experienced but this was easily removed by steaming. Fire temperatures were carried considerably lower than normal. Some naphthalene was formed when fire temperatures were carried too low, but this entirely disappeared when the temperature was raised. It was found necessary to clean the generator fire only once a week. No attempt has been made to evaluate the savings in labor, but on account of the small amount of coke used and the infrequent fire cleans, this should be a factor to be considered.

Experience at the Hempstead Works indicates that butane reforming can result in considerable savings in any carburetted water gas plant when the price of butane is about 2¢ lower than the price of the enriching oil normally used, particularly if liquified petroleum gas storage equipment is available at the plant.

Catalytic Reforming

Our tube-type continuous catalytic cracking plant at Riverhead has been operated each winter since January 1948 to produce a substitute gas for peak shaving.

Since its inception the plant has produced gas for a total of less than 800 hours. Operating periods have been relatively short to meet only the demands of the peak days. Propane and butane have been used successfully as feed-stocks, producing an entirely satisfactory substitute gas.

After the plant has been started up to meet the first peak of the winter, it is maintained on "hot standby" to be ready to go into production at short notice at any time during the balance of the winter period.

"Hot standby" means maintaining cracking furnace temperatures at approximately 1100° F so that production may be started within 14 hours after notification. If it is desired to reduce this time, furnace temperatures are maintained at a higher level. To prevent undue thermal shock on the tubes, it is recommended that furnace temperatures be increased slowly. Rates of 100° F per hour are used in starting up from cold to 1000° F and 50° F per hour from 1000° F to the operating temperature of 1800° F. Approximately two gallons of furnace oil per eight tube furnace are required to maintain furnace temperatures at 1100° F, or four gallons per hour to maintain temperatures at 1400° F.

The most serious difficulty encountered with the Riverhead operation was the fracture of cracking tubes as a result of thermal shock. We believe that we have now eliminated the cause of these fractures and expect, with the necessary precautions, to extend greatly the life of these tubes. The frequent on and off type of operation, with the consequent wide fluctuation of tube temperatures, no doubt considerably influences the life of the tubes, and we are of the opinion that continuous operation of the furnaces would result in prolonging the life of the tubes considerably. This has apparently been proved by the continuous operation of a similar plant at Harrisburg, N. J.

Most of the tube failures at Riverhead were caused by undecomposed steam condensing in the primary coolers at the top of the tubes, the condensate falling back to the top of the catalyst in the tube only to be re-evaporated and returned to the coolers, thereby setting up a reflux action which resulted in continuous evaporation taking place in an extremely short section near the top of the tubes. This was evident, on observation, by a black band one or two inches wide on the bright red hot tube. This excessive temperature gradient occurring in an extremely short longitudinal distance of tube obviously caused severe thermal shock which resulted in tube failure.

To eliminate this trouble, the primary coolers were removed from the tops of the tubes, placed to one side and reconnected to the cracking tubes by means of goose-neck pipes, thereby causing the gas flow to be downward into the top of the preheaters. This change made it impossible for condensate to drop back into the cracking tubes, it being discharged in the gas stream from the bottom of the primary coolers and delivered to the washer cooler.

Failure of a tube near the bottom was found to be caused by free condensate in the feed-stock. This is likely to occur on starting up with inlet manifolds and connections cold. A change in the starting up procedure to heat up these lines and remove condensate before admitting the feed to the tubes eliminated these failures.

The maximum capacity obtained on these units was 85 Mcf of finished gas per hour per furnace when making a finished gas of 540 Btu and 0.81 specific gravity. We normally operate at a capacity of 65 Mcf per furnace per hour, making a gas of 540 Btu and 0.70 specific gravity. We have experienced no trouble with carbon deposition. Shutting off tubes for burning out carbon is found to be unnecessary if the air and steam in the feed-stock are adjusted to limit the methane content in the reformed gas to less than four per cent. A falling off in production usually indicates that carbon is being formed. When this occurs, our usual procedure is to increase the amount of air in the feed-stock until production returns to normal.

Reforming of Natural Gas

A new catalytic cracking plant is now under construction at Glenwood Landing for the reforming of natural gas which is expected to arrive by the end of this year. The plant will be capable of converting 20,000 Mcf of natural gas into 37,000 Mcf of 540 Btu, 0.60 gravity gas that will be interchangeable with 540 Btu, 0.70 gravity carburetted water gas now being supplied in this system. The cracking furnaces will be similar to those at Riverhead but of a greatly improved design. The reforming process will use a high proportion of air and a low proportion of steam in the feed, and will produce a gas of the following analysis and characteristics.

Analysis Per Cent by Volume	
CO_2	1.2
CO	11.7
CH_4	40.0
H_2	24.3
N_2	22.8
Total	100.0
H_2 Inert Ratio	1.0
Btu	540
Sp. Gravity	0.60

The furnaces will be equipped to use oil or natural gas for heating and will be provided with waste heat boilers.

Index of Yields : Selected Utilities Stocks

	Sept. 1950	Aug. 1950	July 1950	June 1950	May 1950	Apr. 1950	Mar. 1950	Feb. 1950	Jan. 1950	Dec. 1949	Nov. 1949	Oct. 1949
Natural Gas Transmission Companies	5.71%	5.46%	5.76%	4.86%	4.70%	4.77%	4.57%	4.83%	5.02%	4.75%	4.85%	5.15%
Natural Gas Transmission & Distribution Companies	5.61	5.71	5.79	5.29	5.11	5.14	5.19	5.26	5.23	5.26	5.58	5.61
Manufactured & Mixed Gas Companies	5.52	5.55	5.76	4.98	4.66	4.77	4.71	4.75	4.62	4.75	4.94	5.07
Class "A" Electric Companies	5.67	5.59	5.64	4.94	5.13	5.24	5.15	5.38	5.40	5.48	5.49	5.53
Class "B" Electric Companies	6.06	6.35	6.41	5.58	5.30	5.37	5.42	5.37	5.47	5.68	5.77	5.96

Method of Compiling Index of Yields

This is a straight arithmetical index of comparative yields obtainable on a selected group of gas and electric utility industry common stocks.

The companies comprising this index have been selected by the AMERICAN GAS JOURNAL as providing a representative cross-section of each industry, from the standpoint of geographical diversification and of the relative importance of the individual companies in their areas.

No effort has been made to weight the average to give effect to changes in capitalization or in dividend rates because the yields afforded on the issues reflect such changes. The index is designed to show the rate of return and not necessarily market movements on the stocks comprising it.

The companies used in compiling this index are:

Natural Gas Transmission Companies: El Paso Natural Gas Co.; Northern Natural Gas Co.; Panhandle Eastern Pipe Line Co.; Southern Natural Gas Co.; Tennessee Gas Transmission Co.

Natural Gas Transmission and Distribution Companies: Columbia Gas System, Inc.; Consolidated Natural Gas Co.; Lone Star Gas Co.; Oklahoma Natural Gas Co.; Pacific Lighting Corp.

Manufactured and Mixed Gas Companies: Bridgeport Gas Light Co.; Brooklyn Union Gas Co.; United Gas Improvement Co.; Peoples Gas Light & Coke Co.

Class "A" Electric Companies: Boston Edison Co.; Commonwealth Edison Co.; Houston Lighting & Power Co.; Southern California Edison Co., Ltd.

Class "B" Electric Companies: Dayton Power & Light Co.; Hartford Electric Light Co.; Pennsylvania Power & Light Co.; Public Service Co. of Colorado; San Diego Gas & Electric Co.

DESPITE nervousness induced by the Korean conflict and by the Federal Government's bond refunding operation, the bond market has given a good account of itself of late.

This is shown in the proceeds of 101.10 per cent obtained by Tennessee Gas Transmission Co. on its new issue of $40 million of new 20-year first mortgage bonds sold as this copy went to press. The issue is being re-offered at a price of 101.75 per cent where the yield is 2.884 per cent.

A significant thing about the sale is not so much the price to the company, but the fact that only about one cent per bond separated the two high bids for the issue.

This may be explained in two ways: The inventory of new bonds in underwriters' hands is scant and the competing investment bankers had a very good knowledge of just about what price the insurance companies would be willing to pay for the Tennessee Gas bonds.

For months past some of the leading insurance companies "have been scraping the bottom of the barrel" in their effort to find good utility issues in which to invest, especially in the natural gas field. A yield not too far removed from the three per cent level should find them fairly eager investors.

During the first six months of this year the life insurance companies increased their holdings of corporate bonds and stocks by $813 million. Better than 75 per cent represented debt securities and it is significant that about half of the new debt obligations which these institutional investors purchased were utility issues, aggregating $355 million.

Reflecting the uncertainty attending Uncle Sam's refunding operation which still has several weeks to run (until October 1) is the increase in yields for corporate obligations which has taken place in several weeks. At this writing the yield on prime corporates is at 2.63 per cent, against 2.60 per cent a month ago, while the return on second grade obligations has gone up to 2.64 per cent, from 2.61 per cent.

There Are Two Viewpoints

The same state of mind may be found among stock market observers, who are close to being evenly divided between those who look for increasing government armament spending and expanding payrolls to mean rising production and purchase of everything, and those who take the more pessimistic view that consumer price resistance and higher taxes will prevent runaway production and high earnings.

The market for new corporate bonds is recovering from its unusual dullness of the summer months, which was chiefly an aftermath of the Korean trouble, but the millions of new issues coming to market over the weeks just ahead constitute only a small segment of the financing required to enable the gas and electric utility companies to raise the huge funds still needed for construction. A clear idea of the longer term outlook along this line must await departure of the Government from the market scene.

Institutional investors recently have been screening their stock portfolios with a fine-tooth comb, weeding out shares of companies likely to be unusually hard hit by imposition of excess profits taxes.

Managers of these institutional portfolios are reasonably optimistic on the outlook for the stock market as a whole during the coming year. Inflation will be slow in developing as a market force, they reckon, and despite the heavier impact of taxes and costs, both earnings and dividend payments will continue on a fairly high plane, although necessarily somewhat lower than 1950.

While no industry or segment of an individual industry can be considered "safe" from a tax standpoint, especially those whose sharp expansion in recent years has not permitted creation of a rate base sufficient to insure proper safeguards against the most onerous provisions of an excess profits tax impost, an equitable tax bill which recognizes the economics of the situation would insure favorable treatment for companies in all branches of the utility industry.

This is one development which probably may have to be witnessed before the market for public utility industry equity shares evidences the recuperative powers displayed by industrial stocks from the low to which they fell immediately following the outbreak of the war in Korea.

Electric Stations Set Record In Gas Consumption

The Federal Power Commission reported that electric utility power plants consumed a record 66,707,524,000 cu. ft. of gas during July, an increase of 9.4 per cent over the previous high set in June 1950, and 19.2 per cent above the 55,969,792,000 cu. ft. burned in July a year ago.

Law of Contributory Negligence Protects Gas Corporations

by Leo T. Parker

Attorney at Law, Cincinnati

QUITE a long time ago a reader wrote an interesting letter which contained this request: "Please write a legal article giving rules and illustrations as to what our officials and employes can do to avoid damage liability to pedestrians and others for injuries caused by employes, and what employes can do to assist winning the suits."

First, it is important to know that properly advised employes of gas corporations may lay a strong foundation for winning suits for damages filed by injured pedestrians and other persons by obtaining information, admissions, or statements which may convince a jury that the cause of the injury did not result from negligence of the gas corporation, but that the injury actually resulted from negligence on the part of the injured person to protect himself against the injury.

For example, if an admission is obtained from the injured person to the effect that he knew the danger which caused the injury existed, or that he realized that a dangerous condition was present, then the gas corporation will win the suit because the law is well settled that no person may recover damages for any injury sustained as a result of his own carelessness. Testimony that the injured person had knowledge of the danger indicates *carelessness* on the part of the injured person.

Under ordinary circumstances all persons are expected by law to use an "ordinary" degree of care to protect themselves against injury. In fact, no person is entitled to recover damages for an injury if the evidence indicates that a reasonably prudent person, under identical circumstances, would have exercised such degree of care that the injury would not have occurred.

A review of late and outstanding higher court decisions verifies that, when rendering decisions in injury cases the jury will consider the evidence to determine facts, as follows: (1) Was the injured person exercising at least an ordinary degree of care to protect himself from injury when the accident occurred? (2) Did the injured person know that the thing which caused the injury was dangerous? (3) Would an average prudent and careful person, under the identical circumstances have been injured? (4) Did employes or officials of the gas corporation have knowledge of the defective condition which caused the injury? (5) How long had the defect existed? (6) Would a reasonably prudent and careful employe have permitted the existence of the thing which caused the injury?

Modern higher courts consistently hold that no person is entitled to recover damages for an injury, if the evidence indicates that a reasonably prudent person *under the identical circumstances* would have exercised such care that the injury would *not* have occurred.

For example, in Parsell v. San Diego Gas Co. 106 Pac. (2nd) 935, the testimony showed facts, as follows: A gas company's employes were installing certain gas pipes and they dug a trench in a pavement. The trench was later filled in and repaired, but the employes left broken pieces of concrete along the edge of the pavement. In fact the testimony showed that the broken concrete was allowed to remain on the edge of the sidewalk for several weeks after the excavation was filled. Also, the evidence showed that passing vehicles knocked pieces of the concrete onto the pavement.

One night a pedestrian stepped on a piece of broken concrete, fell to the pavement and received severe injuries. She filed suit against the gas company.

During the trial the injured pedestrian testified that she had frequently walked on the pavement and had seen the piles of concrete but there had never been any broken concrete on the pavement.

The counsel for the gas company contended that the pedestrian was contributory negligent and, therefore, not entitled to recover damages from the gas company because she had seen the piles of broken concrete on the edge of the pavement and that she was negligent in failing to walk carefully on the pavement.

Notwithstanding these contentions the higher court held the gas company liable, and said:

"This street was open to public travel and it appears from the evidence that it was being regularly used both by vehicles and pedestrians. No warning was given and there was no obvious defect which was known to the injured woman which *affected that part of the pavement* upon which she was accustomed to travel."

Hence, this suit could have been won by the gas company upon proof that previously broken pieces of concrete were *usually* on the sidewalk. This testimony would have convinced the jury that the pedestrian was negligent in walking on a sidewalk known to be dangerous. Better still, *all* chances of liability would have been eliminated had the employes of the gas corporation removed or hauled away the broken pieces of concrete, and made the sidewalk area free from dangerous conditions.

Knowledge of Danger

For comparison, see Buckingham v. Commary-Peterson, 39 Cal. App. 154. Here a pedestrian was injured while attempting to walk over a street which was being reconstructed and which was not open to public travel.

The higher court held the gas company not liable because the pedestrian was contributory negligent in attempting to walk in an area known and realized to be dangerous by the average and reasonably careful citizen.

Also, see the leading case of Mora v. Favilla, 186 Cal. 199. Here the testimony showed that another safe way existed and the injured pedestrian was warned that the sidewalk was in a dangerous condition. The court held the pedestrian *not* entitled to recover damages.

All higher courts agree that a pedestrian may recover damages for an injury caused by a defective condition, or a dangerous situation, of which the gas company's employes and officials had knowledge and neglected to repair promptly and make safe.

See McKay v. Ohio Fuel Gas Co., 51 N. E. (2d) 909. Here the testimony proved that the gas company employes were negligent in allowing a curb box with a defective lid to extend above the

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Hudson Valley

They've turned on the natural gas in the historic Hudson Valley. Housewives in Poughkeepsie, Newburgh, Kingston and other valley cities are discovering its advantages—its cleanliness, its convenience and its superiority as a household fuel.

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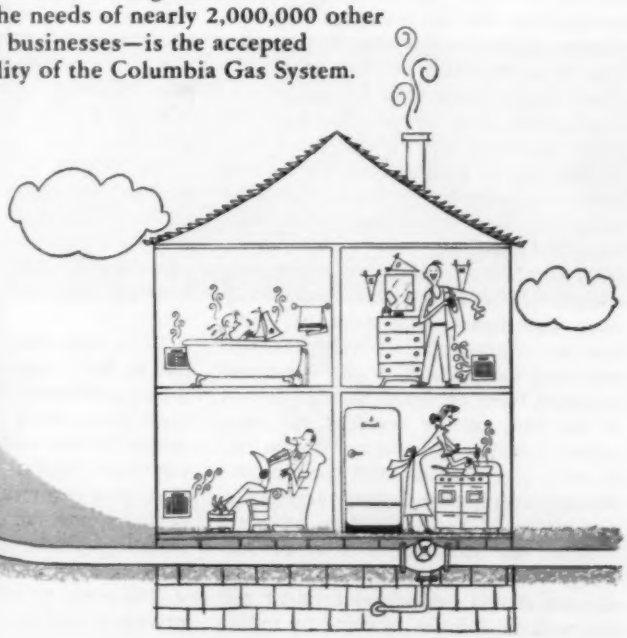
As a result, in 1950 nearly 600,000 homes and businesses will get the benefit of natural gas service for the first time. Meeting their need for gas—and the needs of nearly 2,000,000 other homes and businesses—is the accepted responsibility of the Columbia Gas System.

COLUMBIA GAS SYSTEM

COLUMBIA GAS SYSTEM



level of the sidewalk. Further testimony showed that the lid had been in broken and dangerous condition for a long period of time and also the company officials knew or by application of reasonable diligence in having the box inspected should have known of the dangerous condition and repaired the same.

It is interesting to observe that the higher court held the gas company liable for injuries sustained by the pedestrian for the reasons: (1) The box had been broken for a long period of time; (2) and had the gas company officials or employes used ordinary care to inspect the box the dangerous condition of the box would have been discovered and necessary repairs made before occurrence of the injury. Also, the court held that the pedestrian was not contributory negligent. The court said:

"There was nothing about this sidewalk that indicated to a casual pedestrian using it at infrequent intervals that it was obviously a hazard. The very fact that it had existed for a long time without being detected by the company and repaired might well indicate that the defect was not so open and apparent as to be a warning to this pedestrian."

Law of Cooperative Negligence

Situations may arise under which *both* the injured pedestrian and the gas company's employes were negligent. Under these circumstances the one with the greater degree of negligence must bear sole responsibility for the injury.

For example, in Seiser v. Redfield, 232 N. W. 129, it was disclosed that a pedestrian was walking in the day time when she fell into an excavated hole and was seriously injured. The pedestrian testified that she had her mind on something important as she walked along, and that she expected the sidewalk to be safe. The evidence proved that by the application of due care the pedestrian should have observed the hole and avoided falling into it although no barriers or other warnings were present. The court held the pedestrian not entitled to damages, and said:

"The sun was shining; it was a clear day. There was no storm, fog, or any other disturbance of the elements. There was no distracting circumstances surrounding the plaintiff. If her mind and attention were occupied just before and at the time of the accident, this was wholly a matter of her own volition and activity. . . . The plaintiff (pedestrian) was guilty of contributory negligence, as a matter of law, and cannot recover."

Also, see McLaury v. City of McGregor, 54 Iowa 717. Here the testimony showed that a pedestrian brought suit for personal injuries received by falling from the sidewalk into an open ditch at the edge of the sidewalk. There was no barrier to prevent her falling into the ditch but the court held the pedestrian not entitled to a recovery, and said:

"Now it appears to us that where a person is walking upon a sidewalk . . . and is in the enjoyment of such degree of light and such eyesight and steps off by inadvertence or want of attention and receives an injury, such person cannot be said to be in the exercise of reasonable care."

Latent Defect

Considerable discussion has arisen from time to time over the legal question: What nature of defect and testimony will relieve a gas corporation from liability for injuries to a pedestrian?

A review of leading higher court decisions discloses that a gas corporation is *not* liable for an injury to a pedestrian if the testimony shows (1) that the injured person was contributory negligent; or (2) that the gas company's employes exercised due diligence and care to repair a defect or dangerous condition; or (3) the condition which caused the injury had *not* existed for so long a period that the corporation's employes should have discovered and repaired it had they used due diligence and care; or (4) that an unknown person performed an act which resulted in the dangerous condition and the gas company's officials had not been notified of the defect or dangerous condition.

For illustration, in Cline v. Evans, 31 S. E. (2d) 681, a pedestrian sued the Pineville Gas Co. for damages for injuries sustained when she stepped into an open tile originally installed by gas company employes. The tile covered a valve connected with gas lines. The lower court held the gas company liable because the testimony showed that the open tile was dangerous and concealed from view of an ordinarily prudent and careful pedestrian. The latter appealed to the higher court and proved that when the tile was originally installed by its employes it was safe, but that recently an unknown person had stolen the lid. In view of this testimony the higher court reversed the lower court's decision, and said:

"The defendants (gas company) cannot be held responsible for the acts of third parties making the situation unsafe, until it is shown either that they had notice of that condition, or a sufficient time had elapsed when it could be said that they should, in the exercise of ordinary care, have known that their distributing system was in an unsafe condition . . ."

The same relative law on damage to private property is applicable, as above explained, with respect to injuries to persons. In other words, a contributory negligent property owner cannot recover damages for damage to his property. On the other hand, while the court may hold a gas company liable purely on circumstancial evidence, yet a gas company *never* is responsible for damage caused by employes who act outside the scope of their employment or authority.

For illustration, in Yore v. Pacific Co., 277 Pac. 879, it was disclosed that employes of a gas corporation set fire to private property when smoking cigarettes under extremely dangerous circumstances. The owner of the property sued the gas company for damages.

However, since it was proved that none of the company officials or the foreman knew that the workmen were in the habit of smoking cigarettes while working under similar dangerous conditions the court held the gas company not liable, stating the following important law:

" . . . as a general rule, an employer is not liable for damages resulting from fires started by an employe merely to serve his own pleasure or purpose, which acts have no connection with the duties of his employment, and which have not been directly or indirectly authorized or ratified . . ."

The same law is applicable to a gas company's employe who assaults or slanders a company's customer.

For illustration, in Milazzo v. Kansas City Gas Co., 180 S. W. (2d) 1, the testimony showed facts, as follows: In a store basement was the gas meter. One day, so the testimony was given, the company's meter reader wearing the regulation uniform and badge came to read the meter. He knew where the meter was located, since he had read it on other occasions. When he entered the store and started for the basement, the store owner made a remark to the meter reader who then called the former a bastard. When the meter reader had read the meter, he returned to the store and he and the store owner got into a fight. The meter reader struck the store owner with his flashlight seriously injuring him. The property owner sued the gas company for damages. It is interesting to observe that the court held the gas company not liable, and said:

"There was no evidence from which it could be inferred that Horace (meter reader), at the time of making the assault was endeavoring to accomplish any of the work the defendant (gas company) had intrusted to him. There was no evidence that Horace in assaulting plaintiff (store owner) was acting within the expressed, apparent or implied scope of his authority as a meter reader. . . ."

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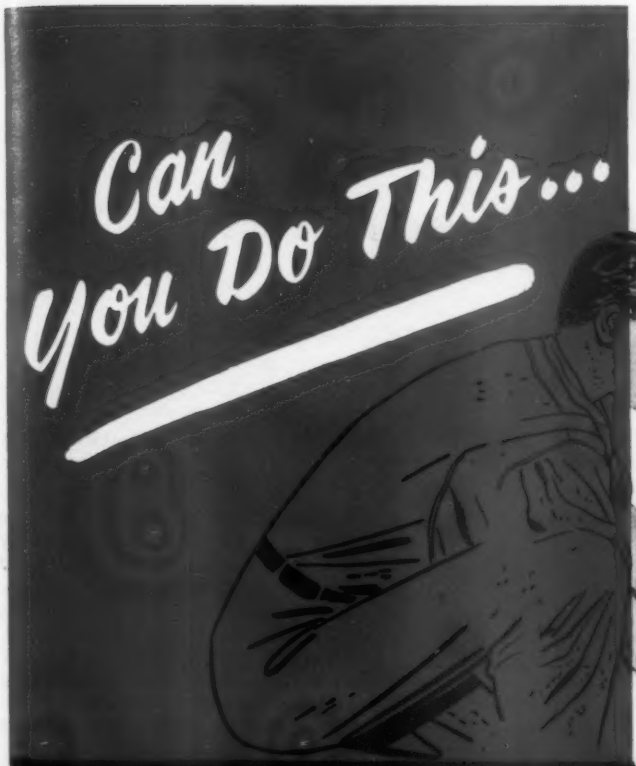

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News of the Gas Industry

United Natural Announces Promotion of Six Men

Organization changes in United Natural Gas Co., Oil City, Pa., and its associated companies have resulted in advancement for several local and district employees of the firm, R. H. Rose, President, recently announced.

George F. Gearhart was promoted from chief civil engineer to superintendent of transmission compressor stations. Charles E. Williams was advanced from chief gas dispatcher to superintendent of transmission mains, and Donald T. Secor from chief geologist to superintendent of production and underground storage.

All are residents of Oil City and for many years have been employed in administrative capacities in the gas company's general offices.

Other promotions are: Harry A. Goodman from distribution foreman, Meadville, to assistant superintendent of distribution with headquarters in Oil City; William T. Wardwell, from distribution foreman, DuBois, to distribution foreman in Meadville; and Fred A. Rossey from supervisor, DuBois, to distribution foreman.

Bernard M. Laulhere Dies In California

Bernard M. Laulhere, 64, former manager of engineering services for the Southern California Gas Co. succumbed recently following a prolonged illness.

Born in France, Mr. Laulhere came to California and attended public schools in San Francisco. Later he attended Stanford University.

He was employed in 1921 by the Midway Gas Co. and worked in various engineering capacities, becoming superintendent of transmission in 1923. He was active in construction during the development of the highly productive Santa Fe Springs, Signal Hill, and Huntington Beach oil and gas fields.

Later he returned to engineering work for the Southern California Gas Co. as supervising engineer and then as manager of engineering services.

In 1947 he suffered his first illness from which he failed to recover completely.

L. L. Armstrong R. J. Dunbar

L. L. Armstrong & R. J. Dunbar Join Commonwealth Natural

L. L. Armstrong has been appointed chief engineer of the Commonwealth Natural Gas Corp., Richmond, according to Erick Larson, President.

Prior to his appointment, Mr. Armstrong was connected with Tennessee Gas Transmission Corp. at its main office in Houston. A veteran of 30 years experience in the natural gas industry, Mr. Armstrong has served in Nebraska, Kansas, Oklahoma and Texas in various positions connected with the construction and operation of pipe lines.

He originally started out in the pipe line and production department of Cities Service Co. In 1930 he became associated with Northern Natural Gas Co. in Omaha. Later he served for a period with the Federal Power Commission and, subsequently, in 1946, joined Tennessee Gas Transmission where he served in various capacities, among which was his position as pipe line superintendent of the Big and Little Inch oil lines when conversion was first made from oil to natural gas.

Mr. Larson also announced the selection of Robert J. Dunbar as assistant chief engineer.

Mr. Dunbar was formerly associated with the Pittsburgh-West Virginia Gas Co., where he engaged in production, transmission and gas measurement work. He attended Salem College and the New Mexico School of Mines. He then became associated with the Hope Natural Gas Co. and, subsequently, the Geophysical Company, Mr. Dunbar has been active in the Appalachian Gas Measurement Short Course and West Virginia University Extension Courses in Petroleum and Natural Gas.

National Defense Committee Appointed by AGA

Appointment of a National Defense Committee to meet national emergency problems related to the gas industry and to provide effective support of the government in the current war crisis, has been announced by Hugh H. Cuthrell, President, American Gas Association. J French Robinson, President, The East Ohio Gas Co., and a past AGA President, is chairman of the new 12 man committee.

Other members of the committee are: Eskil I. Bjork, vice-president, The Peoples Gas Light & Coke Co.; Everett J. Boothby, President, Washington Gas Light Co.; Joseph Bowes, President, Oklahoma Natural Gas Co.; Arthur F. Bridge, President, Southern Counties Gas Co.; E. H. Eacker, President, Boston Consolidated Gas Co.; Harland C. Forbes, executive vice-president, Consolidated Edison Co. of New York; D. A. Hulcy, President, Lone Star Gas Co.; Alexander Macomber, President, Gas Service, Inc.; William G. Maguire, chairman of board, Panhandle Eastern Pipe Line Co.; George S. Young, executive vice-president, The Columbia Gas System, Inc.; and N. Henry Gellert, President, Seattle Gas Co.

The committee is now considering the steel supply problem and its effect on the gas industry's record expansion program. Steel requirements for gas distribution are now being determined by an AGA survey.

The committee will also cooperate with the National Petroleum Council in a study of pipe line and production requirements and with the Gas Appliance Manufacturers Association in an analysis of the appliance manufacturers' requirements for steel, copper, brass and aluminum.

Chairman Robinson indicated that the committee will render the same type of service as the AGA War Activities Committee which guided gas industry effort in the last war.

Manpower, national nutritional problems, war protection of gas plants and personnel, conservation and salvage of essential materials, and adequate gas supply for defense industries, are among the topics on the agenda of the National Defense Committee.

LOW LABOR COSTS FOR CLEANING result from the slag-resistant properties of the Norton Crystolon* silicon carbide door arches and circle brick in this typical gas generator.

Lined to last 10,000 hours or more

... *with NORTON CRYSTOLON bricks and blocks*

If fire-clay brick walls are causing you to shut down your generators every 3500 hours or so for repair of spalled, eroded or cracked refractories, it will pay you to switch to Norton Crystolon silicon carbide walls.

True, your first cost is higher but increased generator capacity, lower labor costs for maintenance and longer lining life make up the difference many times over.

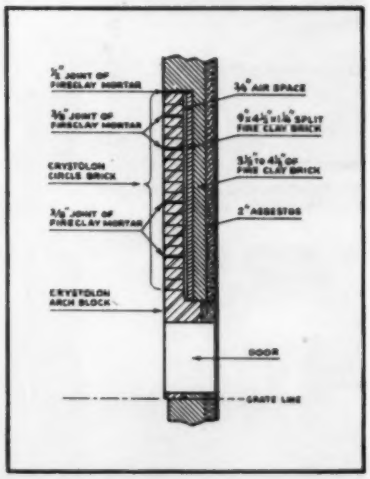
High resistance to slag penetration pays off 3 ways

Because Norton Crystolon bricks and blocks are so hard and dense, slag can't penetrate; clinkers can't get a death-grip on the walls. In fact, when the clinker ring is broken, it just falls free without pulling away the surface of the brick. This means that you can quickly and easily maintain a larger effective generator cross-section for maximum production. It means that you spend less labor time, lose less production time, for cleaning operations. It also means that freedom from spalling adds hours to the life of your walls.

Write for Bulletin 862

For more complete information about Crystolon shapes as applied to gas generator walls, consult your nearby Norton representative, or write direct for Bulletin 862. NORTON COMPANY, 701 New Bond St., Worcester 6, Mass.

*Trade-Marks Reg. U. S. Pat. Off. and Foreign Countries



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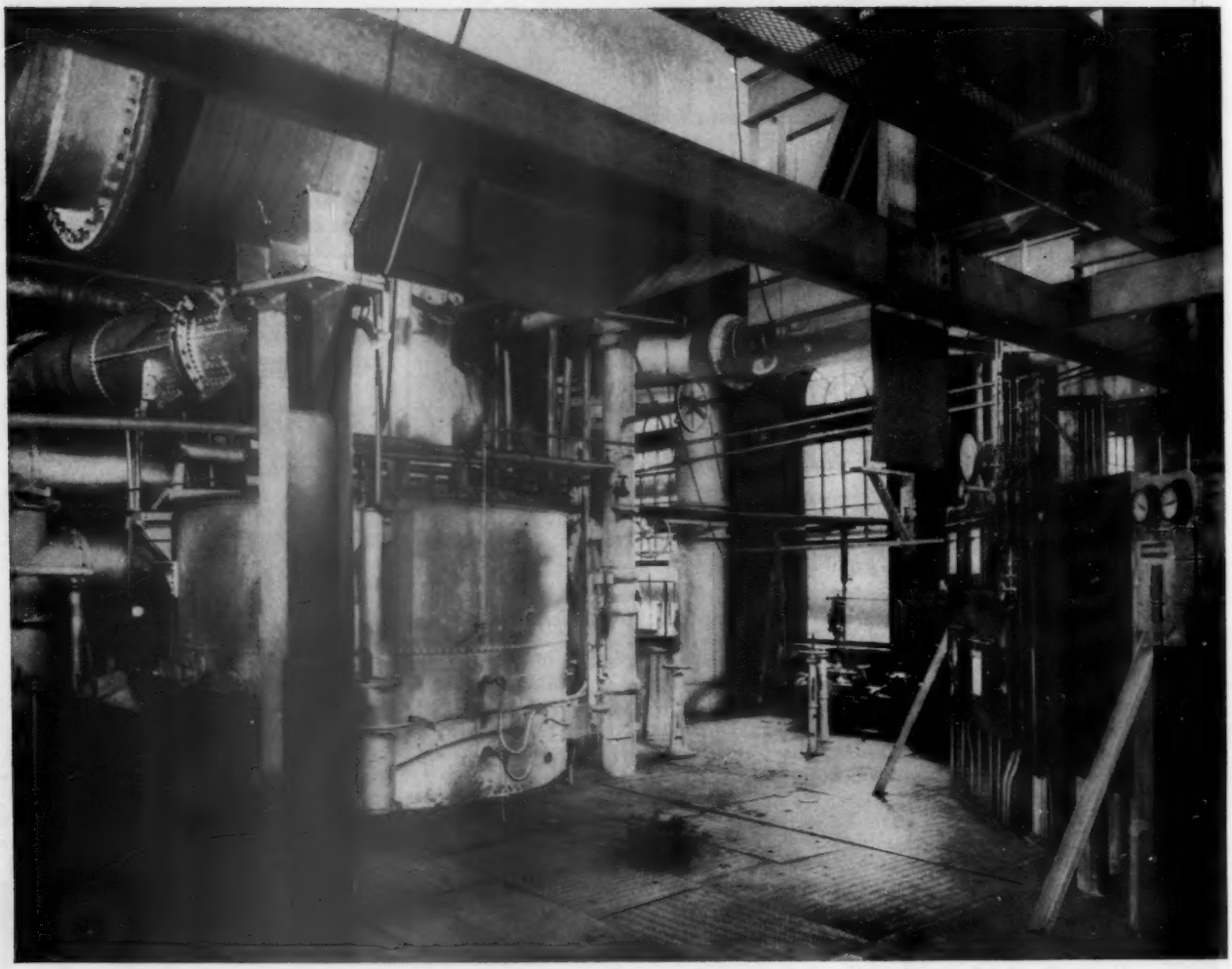

This installation at the Station "A" Plant of the Philadelphia Gas Works Company has produced more than 4½-billion cubic feet of city sendout gas.

CYCLIC CATALYTIC REFORMING PROCESS* SETS

NATURAL GAS FOR BASE LOAD
L. P. GASES FOR PEAK LOAD

LOW INVESTMENT COST

The modification of existing gas generating equipment or installations of new units feeding into an existing gas train, is both practical and economical.

Most existing parts and auxiliaries for a water gas set can be re-used without change when applying the C.C.R. Process.

Usually no changes to purification and handling equipment in the gas train are required.

LOW PRODUCTION COST

The chief factors contributing to low production cost include:

Uniform and easily-controlled direct heating of catalyst.

High overall thermal efficiencies with corresponding low fuel requirements.

High capacities with minimum labor.

A simple process with durable apparatus and long catalyst life for dependable operation.

FLEXIBILITY FOR INTERCHANGING GASES

The C. C. R. Process produces reformed gas of various characteristics. When enriched with natural gas, the reformed gas interchanges properly with most gas mixtures now being used by the manufactured gas industry. By control of the Process, through enrichment or mixing, the desired characteristics, suitable for straight oven gas or water gas substitution, are obtained.

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WITH A BACKGROUND OF OVER SIXTY YEARS' EXPERIENCE

*Patent Pending

R. J. Canniff

C. F. Pearson

R. J. Canniff & C. F. Pearson Now Head New Servel Departments

Two executive appointments at Servel, Inc., have been announced by W. Paul Jones, President. Robert J. Canniff, formerly advertising and sales promotion manager, assumes the directorship of advertising and public relations. Charles F. Pearson becomes sales promotion manager. Before joining Servel, Mr. Pearson was assistant sales promotion manager at Hotpoint, Inc., Chicago.

The two new departments were formed to meet the increased demands of Servel's greatly expanded program of advertising, public relations and sales promotion. "With this step, Servel is placing greater emphasis on public relations in every phase of the manufacture and sale of its gas refrigerators, water heaters, and air conditioning equipment," Mr. Jones said.

Mr. Canniff, who has been a member of the Servel organization for more than ten years, has been prominently identified with many phases of the gas industry. He has appeared frequently on gas industry convention programs as a speaker on sales and merchandising.

Before joining Servel in 1939, Mr. Canniff served as sales promotion manager of the Central Hudson Gas & Electric Corp., western sales manager of the Standard Gas Equipment Corp., Chicago, sales manager of the Pittsburgh Water Heating Co., Pittsburgh, and sales promotion manager of the Ruud Manufacturing Co., Pittsburgh.

Mr. Pearson operated his own advertising agency in Lakeland, Fla., until 1942, when he entered the Army. After his separation from service, he became associated with the Conley Advertising Agency in Chicago as an account executive. He joined Hotpoint in 1947 as assistant sales promotion manager for refrigerators, ranges and water heaters.

T. A. Holden Now Manager

Thomas A. Holden has been appointed manager of operation at Martinsburg Gas and Heating Co., Martinsburg, West Virginia, replacing G. Frank Stinnett, according to an announcement by H. Emerson Thomas, President of the company.

Mr. Holden has been associated with the gas industry during the past 26 years.

Con Edison Appoints O. W. Manz Manager of Operations

Otto W. Manz, Jr., has been appointed manager of the system operation department of Consolidated Edison Co. of New York.

A graduate of the University of Pennsylvania, Mr. Manz was employed by Consolidated Edison as a field tester. He had advanced to division engineer when he was placed on the company's executive development program in which he served at various posts throughout the system.

Since May 1950, he has been chairman of the natural gas operations committee of the five New York utility companies which will receive gas through the new Transcontinental pipe line.

Schultz Now Cashier at Peoples Natural Gas Co.

Edward J. Schultz has been appointed cashier of The Peoples Natural Gas Co., it has been announced by E. M. Borger, President.

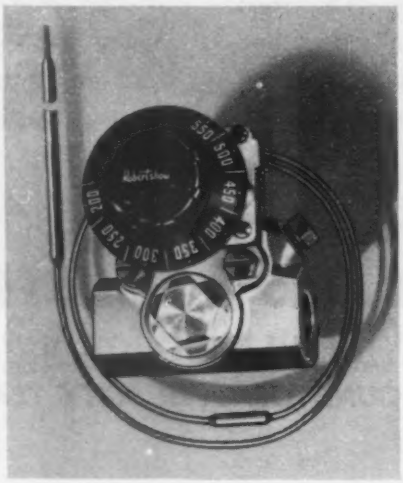
Mr. Schultz, a company treasury department employee since October 1929, succeeded John C. McCutchen who retired September 1.

Robertshaw's New Control

A new hydraulic throttling type control for commercial cooking equipment has been announced by the Robertshaw Thermostat Division of the Robertshaw-Fulton Controls Co., Youngwood, Pa.

Known as the model DG, it embodies the standard Robertshaw type diastat, is compensated for ambient temperature up to 350°, and will be available only with high temperature equipment diastat.

The new design eliminates the gland pin while providing all front adjustments for recalibration, pilot and bypass, removing valve and cleaning valve seat. The diastat can be removed and replaced without disconnecting body.



New throttling type control

F. Whitworth

Charles Stewart

Sprague Announces Advances For Whitworth and Stewart

The Sprague Meter Co. has announced the appointment of F. Whitworth as works manager. Simultaneously it was announced that Charles Stewart would succeed him as chief engineer.

The new works manager has been associated with Sprague since 1939 and has been chief engineer since 1944. While in that position he was responsible for the development of an aluminum meter, and the development of, in conjunction with Mr. Stewart, the metal flanged diaphragm and the "No. 1500" regulator. He is also the inventor of several patented features of his company's products.

Won GAMA Award

Mr. Whitworth is a director of E. F. Griffith Co. in Philadelphia. In 1949 he received the GAMA award for meritorious service in the gas industry.

Mr. Stewart is author of technical articles on metering and gas utilization. As research engineer, he was largely responsible for the development of Sprague's combination meter and regulator.

Hindman Named General Manager of Louisiana Natural

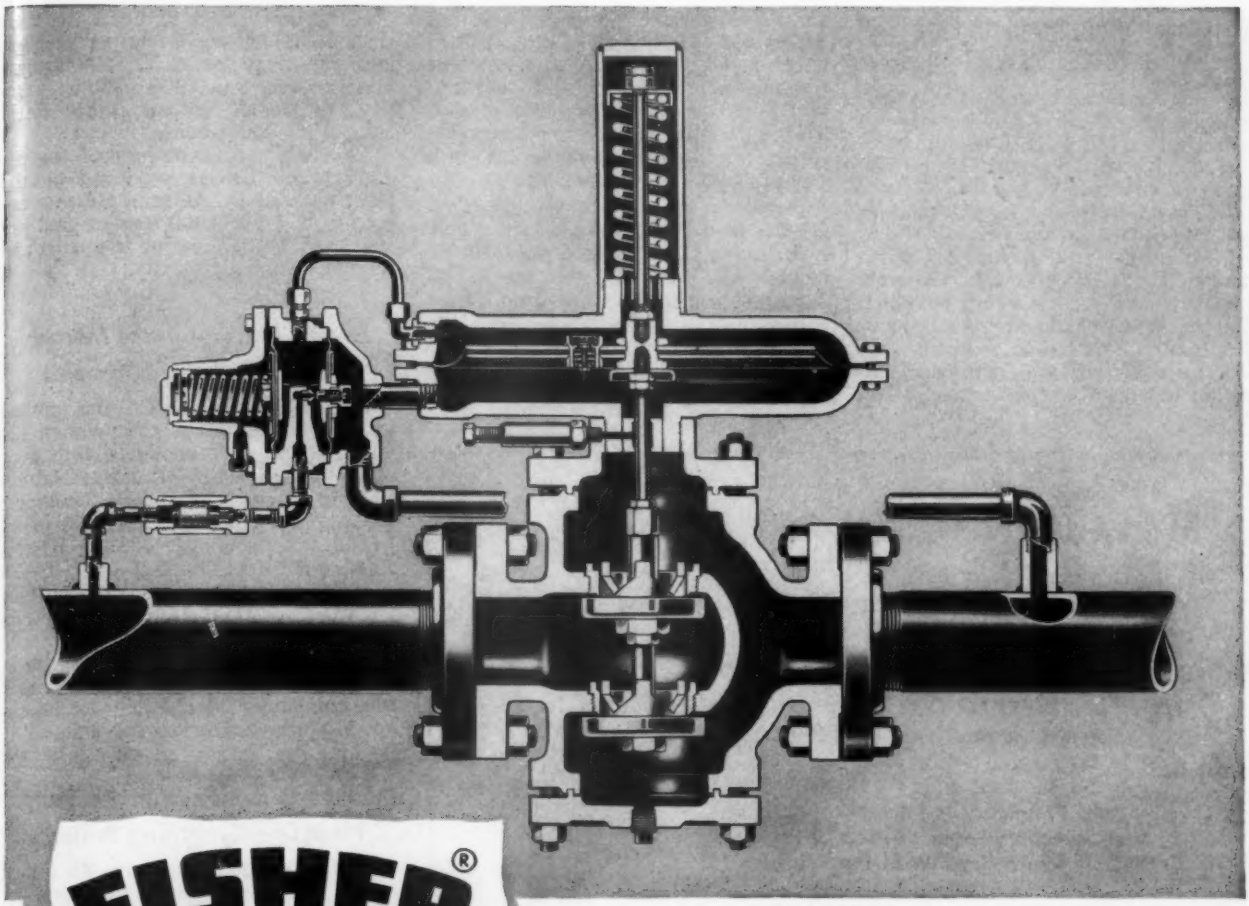
The board of directors of Louisiana Natural Gas Corp. has announced the appointment of Ewell F. Hindman as general manager of the company.

For twenty years Mr. Hindman was associated with Arkansas-Louisiana Gas Co. in various capacities including operations, gas measurement and leakage engineering. He joined Louisiana Natural in 1949 as pipe line superintendent and continued in that capacity until his promotion to general manager.

Bayles Is Chief Stratigrapher For Consolidated Natural

Robert E. Bayles has been appointed chief stratigrapher for Consolidated Natural Gas Co.

Mr. Bayles, who will work out of the Pittsburgh office of The Peoples Natural Gas Co., will be responsible for special stratigraphic studies and surface geological problems for the various subsidiaries of Consolidated Natural Gas Co.



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For reduced pressure from 2 to 65 psi and for inlet pressure up to 150 lbs. Handles unusual capacity and load changes while maintaining extremely accurate control pressure. Available with hard or soft seat construction in pipe sizes 1" thru 12".

WRITE FOR BULLETIN P-299

FISHER LEADS THE INDUSTRY IN RESEARCH FOR BETTER GAS PRESSURE CONTROL

FISHER GOVERNOR CO.
MARSHALLTOWN, IOWA

Gasoline Extraction Plant To Be Built In Italy

North American Petroleum Gas Corporation, New York, has obtained a contract to build a gasoline extraction plant in Italy with a capacity of 100 million cubic feet of natural gas per day. This will be the largest gasoline extraction plant in Europe.

Most of the natural gas in Italy is handled by AGIP (Azienda Generale Italiana Petroli) a company in which the Italian Government is the main shareholder. This Italian company covers a large territory with petroleum and natural gas distribution stations. AGIP has developed the Cortemaggiore field which has approximately three trillion cubic feet of estimated reserves. The production of natural gas a year ago was approximately 20 million cf/day. The quantity trebled in a year and is expected to be approximately 200 million cf/day in a few years. The gasoline extraction plant was ordered by AGIP for this field. It will extract condensible hydrocarbons from natural gas available at high well pressure (1800 psig). The plant will use the pressure drop of the natural gas for refrigeration of the absorbent and will produce its own electricity and steam.

When completed, the output of the plant is anticipated to be as follows: On a 35 billion cubic feet per year gas throughout: propane, 12,500,000 gallons; butane, 9,000,000 gallons; gasoline, 22,000,000 gallons; other distillates, 5,000,000 gallons.

The fuel equivalent in coal for the natural and LP-gas produced by the plant ordered by AGIP represents approximately 2,000,000 tons of coal per year, an important saving in import and foreign exchange for Italy.

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MALCOLM W. BLACK OWEN C. JONES FRANK E. MOORE
FRED L. CRABBE JAMES E. MENAH GERALD L. STEBBINS

United Natural Plans Merger With Four Gas Companies

United Natural Gas Co. has applied to the Federal Power Commission for authorization to consolidate with four other gas companies—Ridgway Natural Gas, St. Marys Natural Gas, Smethport Natural Gas, and Mercer County Gas.

The five companies, all subsidiaries of National Fuel Gas Co., and all with main offices in Oil City, Pa., would form a new corporation, also to be known as United Natural Gas Co.

United operates a pipe line system in Ohio and Pennsylvania, while the other four companies serve various communities in northwestern Pennsylvania.

Surface Combustion Presents New Dry Cyaniding Bulletin

Surface Combustion Corp. has issued a new bulletin presenting the latest developments in the equipment and applications of the dry (gas) cyaniding process.

The bulletin describes both liquid quenching and slow cooling and their application. Modern equipment and typical installations utilizing both continuous and batch-type equipment are presented.

Copies may be obtained by writing to Surface Combustion Corp., Toledo 1.

Toledo Pipe Manufactures New Wheel Cut-off

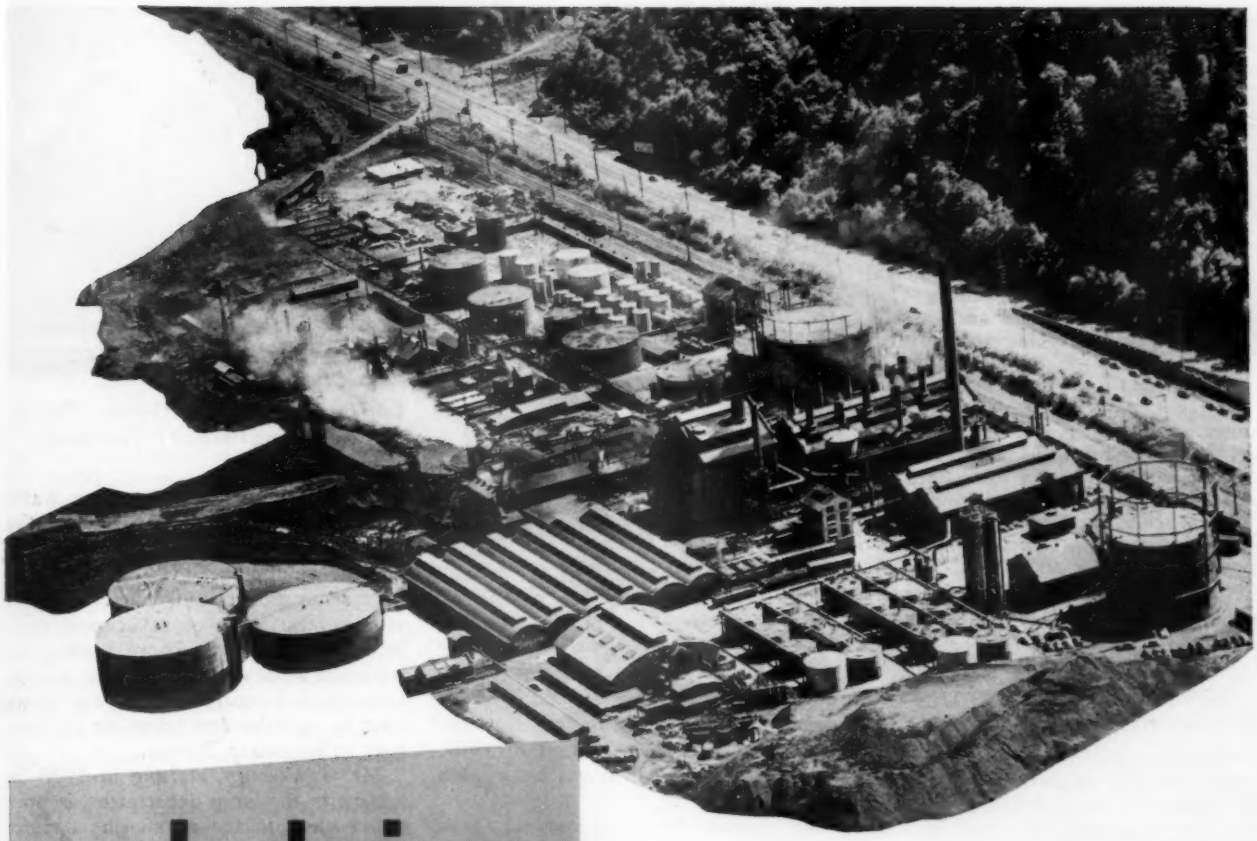
A choice of either wheel and roller cut-off or knife cut-off is now offered on the power pipe machine manufactured by the Toledo Pipe Threading Machine Co.

With the new wheel cut-off, the cutter head is equipped with two rollers and one cutter wheel which is self-centering and fed with a hand wheel.

If a knife cut-off is preferred, the machine is furnished with four cutter knives which leave a straight square-end cut without burr. Blades are fed through a scroll by a small hand wheel.

Both types of cut-off have a thread gauge which shows length of thread being cut and a new flexible oil line.

High production with the machine is claimed because of instant change from cutting to threading, quick change of die heads, no rear chucking, high speed cutting and threading.



helping

the Pacific Northwest meet its gas needs

This manufactured gas plant of the Portland Gas & Coke Company at Portland, Oregon, is the largest in the Pacific Northwest with a capacity of over 50,000,000 cu. ft. per day. Conversion of thirteen existing generators to "rapid cycle" operation and installation of automatic controls increased capacity 16,500,000 cu. ft. per day. This work including installation of a new 6,500,000 cu. ft. per day oil-gas generator was recently engineered and constructed by EBASCO.

But big jobs are nothing new to EBASCO!

For over 40 years, EBASCO has provided a large number of companies producing manufactured gas with *specialized* assistance in constructing complete new plants and improving and expanding existing facilities. Through *one organization*, EBASCO can supply the experience and technical talent needed to handle *any* job, from planning to "in-service" operation.

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J. C. Diehl Elected President Of American Meter Co.

J. C. Diehl

The board of directors of the American Meter Co. have announced the election of John C. Diehl as President. Mr. Diehl was educated at Gettysburg College and Massachusetts Institute of Technology. In 1919 he joined the staff of the American Meter as an engineer, and was made chief engineer in 1929. In 1934 he was elected vice-president.

Mr. Diehl is the author of numerous technical articles and books on gas measurement, three of which have won national recognition as text books.

Norton McKean, President of American Meter since 1941, resigned due to ill health.

Pennsylvania & Southern Gas Announces Official Changes

Pennsylvania and Southern Gas Co. recently announced a change in officers and directors. The new board of directors is composed of H. Emerson Thomas, Westfield, N. J., John F. Bunn, Jr., Philadelphia, William W. Prager, New York, Thomas Kenworthy, Philadelphia, and Frederick Phillips, Marion, Pa. The latter three replace Mark Anton, Sylvester C. Smith, Jr. and R. Gould Morehead, all of New Jersey.

The new board elected H. Emerson Thomas President and treasurer. John F. Bunn, Jr. was elected vice-president, George F. Williams, secretary and assistant treasurer and Willard P. Baldwin, assistant secretary.

Mr. Thomas announced that William H. Nix, Jr., formerly of the Providence Gas Co., has been made assistant to the President and general manager.

Munroe & Tewksbury Honored By Public Service of Colo.

Roy G. Munroe and Herbert P. Tewksbury were given 50-year service pins recently by John E. Loiseau, President of the Public Service Co. of Colorado.

Mr. Munroe, who was employed in 1900 as a meter reader, is now superintendent of the dealers and builders department. He joined the old National Commercial Gas Association in 1909, and has been active in gas association work ever since.

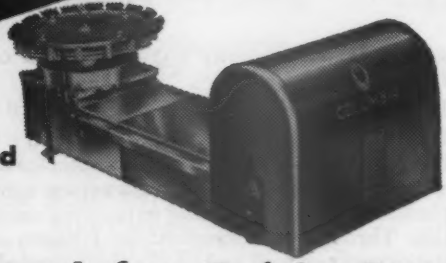
Mr. Munroe has pioneered many uses for gas. In 1910 he sold and installed the first automatic gas storage water heater in Denver. In 1915 he sold the first closed-top hotel gas range, and also the first automatic high-pressure gas-fired steam boiler in Denver. In 1918, after several years of experimentation, he sold the first gas house heating installation against the opposition of the architect and contractors. Several years later he sold the first warm air gas furnace to be used in Denver.

Mr. Tewksbury, starting in 1900 as a clerk in the lamp department, is now senior clerk in the purchasing department of the company.

Left to right: John E. Loiseau, Roy G. Munroe, and Herbert P. Tewksbury.

COLUMBIA Model "J"

Conversion GAS BURNER



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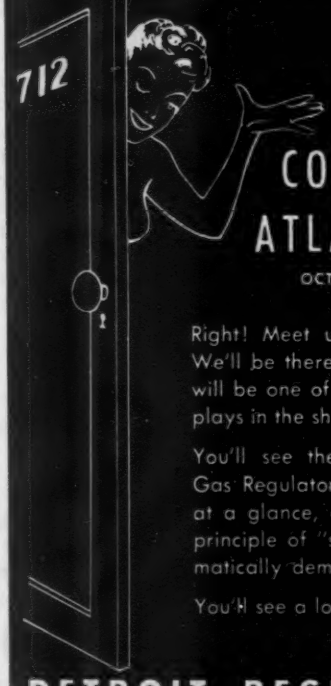

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You'll see the sensational Maxitrol Gas Regulator in action—you'll see, at a glance, our new and exclusive principle of "straight-thru" flow dramatically demonstrated.

You'll see a lot of your friends!

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Texas Illinois Natural Starts New Line Between Texas and Chicago

Laying of the main 30-inch diameter high pressure natural gas pipe line which will join the Chicago region with the Texas Gulf Coast field was begun on August 29 when big new pipe laying machines cut a deep trench through the stubble of a Texas hay field.

The ground-breaking near Wharton was witnessed by a group of Texas and Illinois business and civic leaders. It was the signal for work crews at other locations along the right-of-way to begin laying the large diameter steel pipe for the $120,000,000 project.

Texas Illinois Natural Gas Pipeline Co. an affiliate of The Peoples Gas Light and Coke Co., of Chicago, has put construction crews numbering more than 2,000 men in the field to assure completion of the new pipe line by late 1951.

This will be the third major high pressure natural gas pipe line serving the Chicago metropolitan region and other urban communities in a five state area—Illinois, Indiana, Iowa, Kansas and Nebraska.

When completed, the line will have an initial capacity of 305,000,000 cu. ft. of natural gas daily. Construction of additional compressor stations along the route will eventually raise this figure to over 500,000,000 cu. ft. daily, matching the present capacity of the dual lines of Natural Gas Pipeline Co. of America, also a Peoples Gas affiliate, which extend into the Chicago region from the Texas Panhandle and western Oklahoma fields.

Terminal points of the new pipe line will be at Joliet and Volo, Ill.

Pipe in 40 ft. Lengths

Stretching more than 1,330 miles from the rich gas producing region of south Texas to the Chicago market area, the main portion of the new pipe line will consist of 30-inch electric-welded pipe laid in 40-foot lengths. Smaller-diameter mains bringing the gas from several supply fields converge near Wharton to join the main transmission line.

Representatives of Chicago and Houston, with businessmen from those cities and officers of the two companies, joined in the ceremony as work signals were flashed along the line to construction crews by field radio telephone.

Those who joined in the ceremony included Oscar Hewitt, commissioner of public works of Chicago; General E. O. Thompson, member of the Texas Railroad Commission; James F. Oates, Jr., chairman of Peoples Gas and board chairman of the Texas Illinois company; Joseph J. Hedrick, President of Texas Illinois, and Mark V. Burlingame and Clayton Holmes, vice-presidents of the pipe line company. Mr. Hedrick presided at the brief ceremony.

Hope Proposes To Increase W. Virginia Storage Area

Hope Natural Gas Co., of Clarksburg, W. Va., has applied to the Federal Power Commission for authority to construct pipe line facilities which would increase natural gas deliveries into the company's Fink storage area in Lewis County.

The $790,000 construction program would include a 19½ mile, 18-inch transmission line extending southeasterly from Hope's L. L. Tonkin compressor station in Doddridge County.

The proposed facilities would provide increased pipe line capacity of about 100 million cu. ft. per day into the storage area, and would permit Hope to increase its ultimate volume of gas in the storage area by approximately 25 billion cu. ft.

AND-THE SAME SOLUTION

♦ Seventy-five years ago, gas processors faced the problem of H_2S removal. Then, just as they do today, they turned to Iron Sponge for most efficient purification at lowest cost.

Iron Sponge offers extremely high activity with maximum absorption. Periods between regeneration are longer while the regeneration itself is accomplished quickly and simply.

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Cooper & Freer Are Promoted By Public Service of N. J.

F. Warren Cooper has been made comptroller of Public Service Electric and Gas Co., replacing Franklyn Heydecke, who retired on pension. Frank Freer, Jr. has been appointed to succeed Mr. Cooper as assistant comptroller.

A graduate of New York University with a bachelor of commercial science degree, Mr. Cooper was employed as a bookkeeper with Public Service in 1920. He was named assistant general auditor in 1945 and was made assistant comptroller in 1948.

Mr. Cooper is an active committee member of the American Gas Association and the Edison Electric Institute, Mr. Cooper is also a member of the Institute of Internal Auditors and the Controllers Institute.

Mr. Freer started with Public Service in 1920 as a bookkeeper and was promoted to assistant chief accountant in 1935. He was named chief accountant in 1945. Mr. Freer is a graduate of New York University's School of Commerce.

VULCAN DIAPHRAGMS are *vulcanized* to the rings, with special wire fastening for *extra* security. The seams are vulcanized for a tight seal. Each diaphragm is machine tested for tightness before it leaves the plant.

This means a saving in time and money—in your meter shop and on the consumers' premises. For an aid to accurate metering, specify tight, clean, uniform VULCANS. Save money on original installation and maintenance. Use VULCAN diaphragms for meters, regulators and governors.

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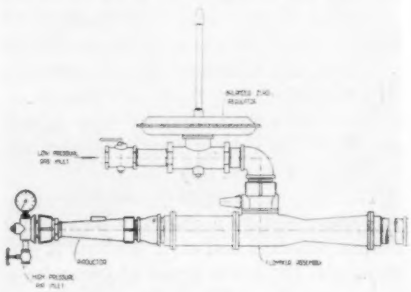
Bryant Industrial 'Air-Ductors'

The new Bryant air-ductor is a device for producing large volumes of low pressure air (up to one pound) using high pressure compressed air as a power source. There are many applications where a supply of compressed air, at 30 to 150 pounds pressure, is available to induce atmospheric air and produce a greatly increased quantity of low pressure air. The air-ductor is recommended for use in installation where the low pressure air usage is infrequent and purchase of a blower would not be justified.



Air-ductors are supplied with outlet connection sized to minimize pressure losses. The assembly includes high pressure needle valves and pressure gauges.

Weinheimer Made a Manager For Calcinator Sales

Elmer J. Weinheimer, prominent in retail appliance trade association work, has been named manager, Calcinator division, of the U. S. Grant Supply Co. of Los Angeles. Mr. Weinheimer plans to initiate and carry through a sales promotion program for the Calcinator home disposal unit.

C. Farrell Engineers Conversion Of Gas Construction & Service

C. B. Farrell, well-known conversion engineer, is in charge of the field work of converting appliances from manufactured gas to natural gas at Roanoke, Charlottesville, and Oneida, according to a recent announcement by The Gas Construction & Service Co., Inc.

The company is also converting customers' appliances at Columbia, South Carolina.

New Automatic Flow Controller Announced by Penn Industrial

Penn Industrial Instrument Corp. of Philadelphia has announced a new automatic flow controller. Highest accuracy is claimed for the large float and long float travel combined with frictionless design. To this is added the pneumatic controller which is equipped with adjustable automatic reset and proportional band adjustable from 0-175 per cent.

Leech and Healy Promoted By Portland Gas & Coke

Promotion of A. O. Leech to gas sales manager of Portland Gas & Coke Co. has been announced by R. G. Barnett, vice-president. Mr. Leech's former position, commercial and industrial sales manager, has been filled by G. E. Healy, formerly supervisor.

Mr. Leech also has charge of Gasco briquet sales. Starting in the utilization laboratory in 1921, he successively became house heating engineer and supervisor of house heating sales.

Mr. Healy started in residential sales in 1927 and was supervisor of commercial and industrial sales at the time of his promotion.

FPC Authorizes Installation Of New Compressor Station

The Federal Power Commission has authorized Arkansas Louisiana Gas Co., of Shreveport, to install a new 7,000 hp compressor station on its natural gas pipe line system near Blanchard.

The station, estimated to cost $1,507,000, will enable the company to transport gas from Louisiana and Texas fields to new retail customers and additional gas to present customers in central Arkansas at required pressures.

Initial installation of three 1,400 hp units will give the station a capacity to compress 65,400,000 cu. ft. daily. The remaining two units are expected to be installed before the 1951-52 heating season, bringing the capacity of the station to 109,000,000 cu. ft.

Canadian Gas

(Continued from page 30)

Canadian thinking—plans to use Pincher Creek for base load requirements and to utilize the southeastern Alberta fields (Lake Pakowki, Manyberries, et al—including possibly the Princess Field) for meeting peak loads during the winter season.

The southeastern Alberta fields probably are not of any importance if a pipe line goes west through the Yellowhead Pass, which is the route proposed by Westcoast Transmission Co., Ltd., to take gas first to Vancouver, British Columbia, thence to our Pacific Northwestern states.

But if Montana Power Co. obtains an export permit—a step which is not considered too likely—this, in turn, would be a blow to Northwest Natural Gas Co., which plans to come directly south through these southeastern Alberta fields and to bring their gas into Oregon and Washington.

The situation will bear constant watching to see just whose ox will be gored as the complex Canadian gas situation unravels itself.

Interchangeability Tests

(Continued from page 28)

to a higher Btu gas raised heating values over a period of a week or two and took care of adjustments as complaints arose. The refrigerators, however, were preadjusted prior to elevating heating values. Where the change to a higher heating value was carried out as outlined for the New England gas companies, the cost was of the order of $1.25 to $1.75 per customer. Where the change to a higher heating value was made by visiting all customers and preadjusting appliances, the cost ran around $4.00 per customer. It has been stated by competent conversion people that the preadjusting method would permit going to as high as 850 Btu/cu. ft. for the $4.00 conversion cost.

Thus it would appear possible for companies desiring to increase distribution capacities with low customer conversion expense to do so using the two methods outlined, one resulting in increase in capacity of 25 per cent at a conversion cost of $1.25 to $1.75 per customer and the other resulting in some 60 per cent increase at a probable cost of $4.00 per customer. The actual cost will depend on appliance saturation and other local factors.

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Steps up gas-making efficiency . . . improves quality . . . saves fuel, manpower!

Built for long life and trouble-free operation, the GASMACO Automatic Time Cycle and Thermal Control assures continuous and efficient service.

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Burt R. Bay Retires and John F. Merriam Becomes President of Northern Natural Gas Co.

Burt R. Bay

The retirement of Burt R. Bay as President of Northern Natural Gas Co. effective September 1, 1950, was announced at a meeting of the board of directors in Omaha on Aug. 21. He will continue as a director.

J. F. Merriam was elected to succeed Mr. Bay as President. Mr. Merriam was serving as executive vice-president and director.

The retirement of Mr. Bay is consistent with the company's policy of retirement at age 65.

Mr. Bay has been with Northern Natural Gas Co. since 1938, when he became executive vice-president and director. He became President on January 1, 1939. Previous to this he was vice-president and general manager of Panhandle Eastern Pipeline Co.

He has had a long and successful career of more than 40 years in the natural gas industry. Included in this was 21 years association with the natural gas subsidiaries of Cities Service and predecessor companies.

During World War II, Mr. Bay served as chairman of the Natural Gas and Natural Gasoline Committee for District No. 2, member of the General Committee for District No. 2, and member of the Petroleum Industry War Council, under the Petroleum Administration for War.

He is a member of the executive council and past President of the Mid-West Gas Association. He has served on the managing and advisory committee, and as Chairman of the Natural Gas Section of the American Gas Association.

He is a former director and a charter member of the Independent Natural Gas Association.

Mr. Merriam has worked for Northern Natural Gas Co. since the first year of its existence in 1930. The various positions which he has held include: assistant secretary, assistant to the president, secretary-treasurer, vice-president and treasurer. For the past two years he has served as executive vice-president. He has been a director since 1946.

At present, Mr. Merriam is a director of three gas associations—American Gas Association, Independent Natural Gas Association of America and the Mid-West Gas Association.

Gas Sales & Revenues Increase In Second Quarter of 1950

Total revenues from sales of gas by utilities for the second quarter of 1950 were $466,000,000, an increase of 18.5 per cent over the like quarter of 1949, the American Gas Association has reported. Revenues from residential sales represented the highest percentage gain, rising 20.4 per cent. Commercial gas revenues were up 12.7 per cent and industrial gas revenues gained 17.2 per cent over a year earlier.

In the twelve-month period ending June 30, 1950, total revenues from utility sales of gas were $1,817,000,000, an increase of 11.9 per cent over revenues of $1,624,000,000 in the previous twelve-month period.

The gas utility industry was serving 23,600,000 customers at the end of June, 1950, an increase of 4.3 per cent over 1949. Residential customers totaled 21,700,000, an increase of 4.3 per cent. Commercial and industrial customers gained 4.2 per cent and 7.1 per cent respectively.

Total revenues from natural gas sales during the second quarter of 1950 were $319,000,000, a rise of 28.1 per cent over the comparable quarter of 1949. For the twelve months ending June 30, 1950, revenues from natural gas sales were $1,240,000,000, an increase of 18.0 per cent over 1949 when natural gas revenues were $1,051,000,000.

Sales of natural gas during the second quarter totaled 882,000,000 Mcf., an increase of 22.1 per cent over the like quarter of 1949. For the year ending June 30, 1950, sales of natural gas amounted to 3,441,000,000 Mcf., a gain of 13.9 per cent over sales of 3,022,000,000 Mcf., in the like period a year earlier. At the end of June, 1950, about 13,900,000 customers were being served with natural gas, an increase of 13.9 per cent.

Revenues from manufactured gas sales in the second quarter of 1950 totaled about $117,000,000, a decrease of 1.5 per cent under $119,000,000, in the like period in 1949. For twelve months ending June 30, 1950, manufactured gas revenues were $478,000,000, a gain of 0.7 per cent over a year earlier.

Manufactured gas sales in the second quarter of 1950 totaled 105,000,000 Mcf., a rise of 2.3 per cent over 102,000,000 Mcf. sold a year earlier. For the twelve months, manufactured gas sales were 429,000,000 Mcf., up 0.5 per cent over 427,000,000 Mcf. sold in the comparable period in 1949. Manufactured gas customers declined in the second quarter, totaling 7,800,000 a decrease of 7.7 per cent.

Revenues from mixed gas sales in the second quarter of 1950 were about $29,000,000 a gain of 18.4 per cent over the comparable quarter in 1949. For the twelve months ending June 30, 1950, mixed gas revenues totaled $100,000,000, a rise of 0.8 per cent over a year earlier.

Mixed gas sales in the second quarter of 1950 were 41,000,000 Mcf., a gain

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  From 150 to 7,500 cu. ft. per hour capacity. For domestic, commercial & industrial use.
- TIME TESTED QUALITY
  One-piece, ribbed steel carriage. Heavy, non-fluttering valves. Flanged cases. Many other proved features.
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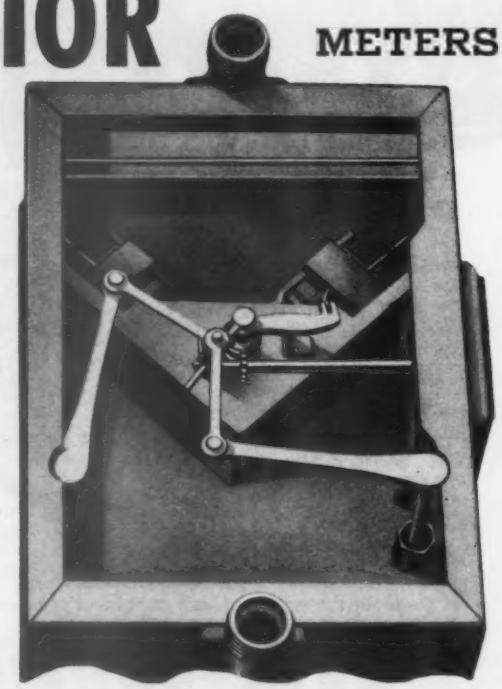
  Interchangeable parts for "Superior" and other makes.
- NATIONALLY RECOGNIZED
  Increasingly specified by America's leading gas utilities.



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of 16.9 per cent over a year earlier, when mixed gas sales totaled about 35,000,000 Mcf. For the twelve months ending June 30, 1950, mixed gas sales were 143,000,000 Mcf., a rise of 0.9 per cent over 142,000,000 Mcf. sold in the previous year. Mixed gas customers at the end of June 1950, numbered 1,800,000 customers, a decrease of 4.6 per cent under the previous year.

State Commission Survey

(Continued from page 22)

mulae, but should reflect the reasonable judgment of the Board based upon all the relevant facts."

Rate of Return:

Not Stated

New Capital Consideration

"The board considers the need of a utility company for a return in dollars sufficient to service its outstanding securities and attract needed additional capital," it reports. "In a particular case such a consideration could have much weight. * * * We subscribe to the doctrine in the 'Hope' case that the * * * end result * * * must be reasonable. In the recent Co-ordinated Transport case the State Supreme Court stated on this point: * * * the rate which a public utility may reasonably charge should be sufficient * * * to enable it to raise money necessary for the proper discharge of its public duties."

New York

Rate Base Used:

Original Cost

Rate of Return:

Varies with the facts in each individual case

New Capital Consideration

In the rate cases which it has decided to date the New York Public Service Commission very definitely has given consideration to the capital requirements and debt financing of the utility, among other factors, in determining the rate of return permitted.

North Carolina

Rate Base Used:

The North Carolina statutes provide that the commission (Utilities Commission) shall give consideration to the value of property, the costs of improvements, and maintenance, *the probable earning capacity under the proposed rates,* sums required to meet operating expenses, and other specific matters pertinent to the case.

Rate of Return:

6 per cent—6.5 per cent

(Continued on page 60)

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An Independent Organization Not Affiliated With Any Other Builders of Gas Holders

(Continued from page 59)

New Capital Consideration

The North Carolina Utilities Commission in its rate decisions does give weight to the needs of the utility for a certain number of additional dollars required to attract new capital.

Oregon

Rate Base Used:

Original Cost, prudently invested

Rate of Return:

Explained Below

New Capital Consideration

"In our determination of rate changes," the Oregon Public Utilities Commission reports, "we give consideration to the past and future cost of capital requirements, and allow a rate of return which we consider adequate to attract new capital."

Pennsylvania

Rate Base Used:

Fair Value

Rate of Return:

The rate of return depends on the evidence in each individual case. "However," the Pennsylvania Public Utility Commission states, "this Commission has found it reasonable in a number of telephone, water and electric utilities to use six per cent, in gas cases 6.5 per cent and in steam heat cases 6.75 per cent."

New Capital Consideration

Not Stated

Vermont

Rate Base Used:

Original Cost

Rate of Return:

New Capital Consideration

In its decisions to date the Vermont Public Service Commission has used as the rate of return the cost of money, both present capital and future needs, with a reasonable allowance for increase in surplus.

Virginia

Rate Base Used:

Original Cost

Rate of Return:

6 per cent in most recent cases

New Capital Consideration

While the individual utility's need for additional capital for expansion purposes enters indirectly into the cases before the Virginia State Corporation Commission in determining the rate base and rate of return, such factors are not given specific consideration, per se, in determining either the rate base or rate of return.

Wisconsin

Rate Base Used:

Original Cost unless it appears that a company cannot earn a reasonable return. In such case the Public Service Commission uses a basis comparable to that approved by the United States Supreme Court in the Market Street Railroad Co. case.

Rate of Return:

No fixed rate. Depends on individual cases.

New Capital Consideration

In determining the rate of return the Wisconsin commission has given serious consideration to the cost of capital and the capital requirements of the particular utility. In certain cases the commission has authorized temporary rates principally due to the fact that earnings of the utility temporarily were at such a level that financing could not be accomplished at a reasonable cost without improved earnings. In each of the cases where this treatment was adopted, the utilities involved required substantial and immediate property additions in order properly to meet their service requirements.

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Pennsylvania Discoveries

(Continued from page 26)

maximum deliverability, whereas the other producers who are not so fortunate as to have markets will be unable to produce any gas, and without proration laws will receive no income from their gas. In the Leidy field, for example, there are some wells being drilled on pieces of land as small as one acre in an effort to get as many holes in the ground as quickly as possible, and to get the gas to market.

Fortunately, in this area there are many depleted gas fields which provide excellent storage facilities for offpeak gas. This enables the producers to produce their wells at a uniform delivery rate which should extend the life of the field.

The Commonwealth of Pennsylvania holds extensive acreage in not only the Leidy field but also the Wharton and the other potential fields that have been previously mentioned. Invitations to bid on leases were submitted to various interested parties in June, but later were withdrawn by the State Attorney General.

The State re-issued an invitation for bids due September 25.

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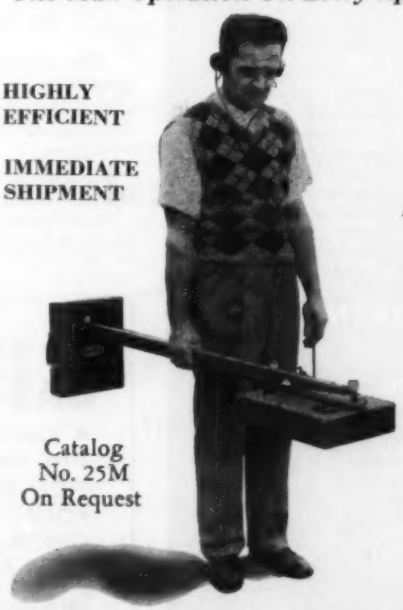

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(Continued from page 36)

authorities, some by city ordinances, and others by gas utilities. Whenever *any* regulations are in effect, they prohibit the installation of water heaters in bath or bedrooms. Many utilities refuse to serve residences which have unvented heaters in either bathrooms or bedrooms. Some permit this usage if permanent means of ventilation is installed. In some cities the installation of direct fired heating units in bathrooms or bedrooms is not permitted if room air is used for combustion or a draft diverter is in the room. The point is that these authorities have nothing against the manufacturer of this equipment. They simply do not want a repetition of tragic events which happened in the past. You do not want any tragic events.

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New Perfex

heaters, which eliminate carrying a variety of heater coils or plugs for the proper heater in the thermostat.

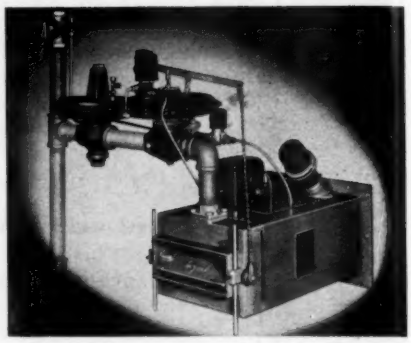
Adjustments ranging from .4 to .8 amps are made by turning an adjusting screw on the back of the thermostat.

Two Men Receive Appointments At Weston Electrical

The appointment of Philip Barnes as general sales manager of Weston Electrical Instrument Corp., Newark, was announced recently by Earl Mellen, President.

Charles B. Denton will succeed Mr. Barnes as advertising manager.

Both men have been associated with Weston for more than 15 years.



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Meter Adapter Available For Horizontal Lines

An adapter is now available for installing Flowrator meters in horizontal process piping, to eliminate a vertical rise in a line where head room is limited, according to an announcement by Fischer & Porter Co. This makes eye-level flow indication for accurate instrument reading possible. The adapter, constructed of corrosion-resistant materials, may be used with all standard meters.

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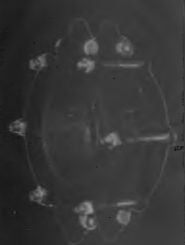

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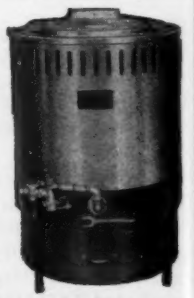

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Domestic Gas Range Shipments All-Time High for August

Preliminary reports from manufacturers indicate that domestic gas range shipments during the month of August 1950 soared to an all-time high, 318,000 units, it was stated recently by the Gas Appliance Manufacturers Association. This is 20 per cent greater than the previous high established in March of this year.

Edward Martin, director of marketing and statistics, said that during the first eight months of 1950, shipments totaled 1,902,900 units or 62.4 per cent greater than reported during the same period of 1949.

Shipments of domestic gas ranges for the comparable seven month period of 1950 were 1,584,900 units, an increase of 64.1 per cent over the same period of 1949.

Donald Dailey Joins Servel As Product Manager

Donald Dailey, well-known industrial designer of gas appliances, has been appointed product manager of Servel, Inc., it was announced recently by W. Paul Jones, President.

Mr. Dailey's responsibility will cover design and development of Servel's appliance products.

For the past four and a half years, he has operated his own firm of industrial design consultants in Philadelphia. He has also written numerous magazine articles on industrial design and has lectured at several universities.

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Bryant Names Charles Lockhart Asst. District Sales Manager

Charles Lockhart, Jr. has been appointed assistant southern district sales manager of Bryant Heater Division, A.G.E., according to an announcement by J. N. Crawford, director of sales. Mr. Lockhart will assist J. H. Swallow, southern district sales manager.

Reconditioning Mains

(Continued from page 29)

used. The coating and wrapping is usually checked for holidays by the utility inspector, and any necessary repairs are made to his satisfaction.

After this, the line is lowered, the temporary flexible service connection is replaced by a permanent connection and the trench is backfilled, and the right-of-way of the line replaced in its original state.

All of the aforementioned work is being done while the pipe line is still in service. Wherever possible, the pressure in the mains is reduced by the utility, without depriving their gas customers of service. Reconditioning work has been performed on operating mains carrying pressures as high as 200 pounds. On projects involving high pressures, extreme care must be taken in all phases of reconditioning.

For the gas utilities who have cast iron mains in their systems, leakage can be curtailed by the early applications of a chemical for expanding the jute packing of the caulked joints. In most cases, due to the slowness and thorough treatment involved, this method is not recommended for immediate heavy leakage problems. Where the jute packing is beyond revitalization, leak clamps are installed. There are many varying opinions among the gas utilities using the chemical treatment, and it has been my experience in talking with the operating men, that they seem to favor the gravity-recovery method of chemical application over the spray or fogging method, wherever possible.

The advent of dry gases has caused line leakage where no previous trouble has been encountered. With the ever increasing natural gas loops coming into being, there are many utilities who will be confronted with the dry gas problem as well as pressure problems with their older mains. Now is the time to check the condition of existing gas mains, and recondition or replace, whichever is more economical or feasible.

There are many utilities who have been aware of line losses for many years, but they have no doubt been reluctant to spend money on replacing their old lines. As can be readily deducted, the phase of reconditioning will allow them to erase their line leakage losses, reduce their service department costs, and increase their revenue without a maximum expenditure or interruption of service to their valued customers.

The cost of reconditioning is not necessarily a budget item; in most cases, it is classified as maintenance. The reconditioning of steel gas mains is found to be most economical on pipe sizes of 4" and larger. The cost of a complete reconditioning operation will usually run between 50 per cent to 70 per cent of the cost of replacing the line.

Of course, where the gas utilities have pipe lines incapable of carrying increased loads because of their size, they will have to be replaced with larger lines. With replacement in mind, they should seriously consider protecting the new lines with adequate coating and wrapping and other corrosion mitigation items, so their investment will be properly insured.

Reconditioning should seriously be considered as the big thrift factor for large and small operating gas utilities.

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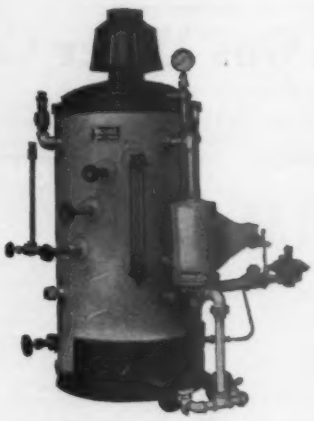
1 H.P. to 45 H.P.



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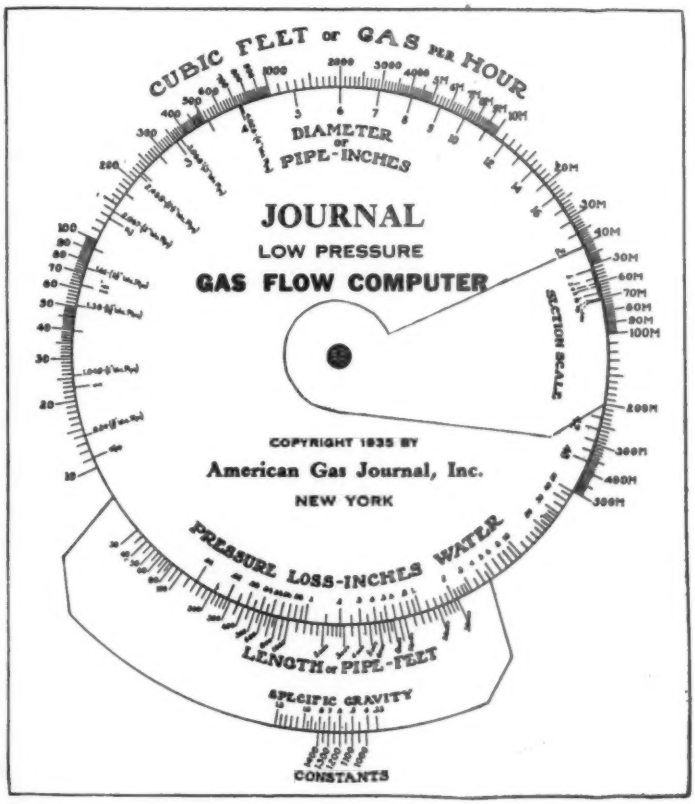

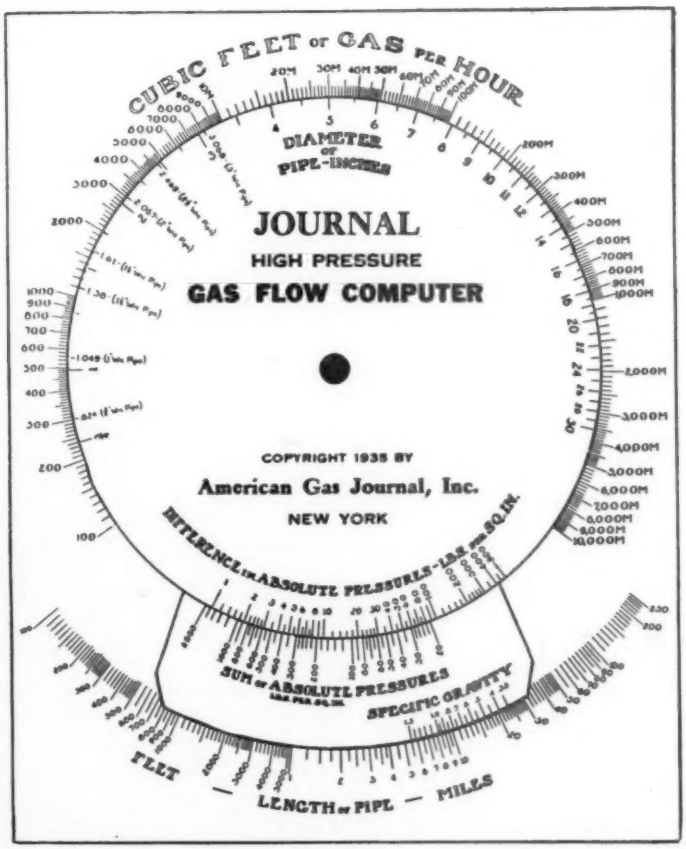

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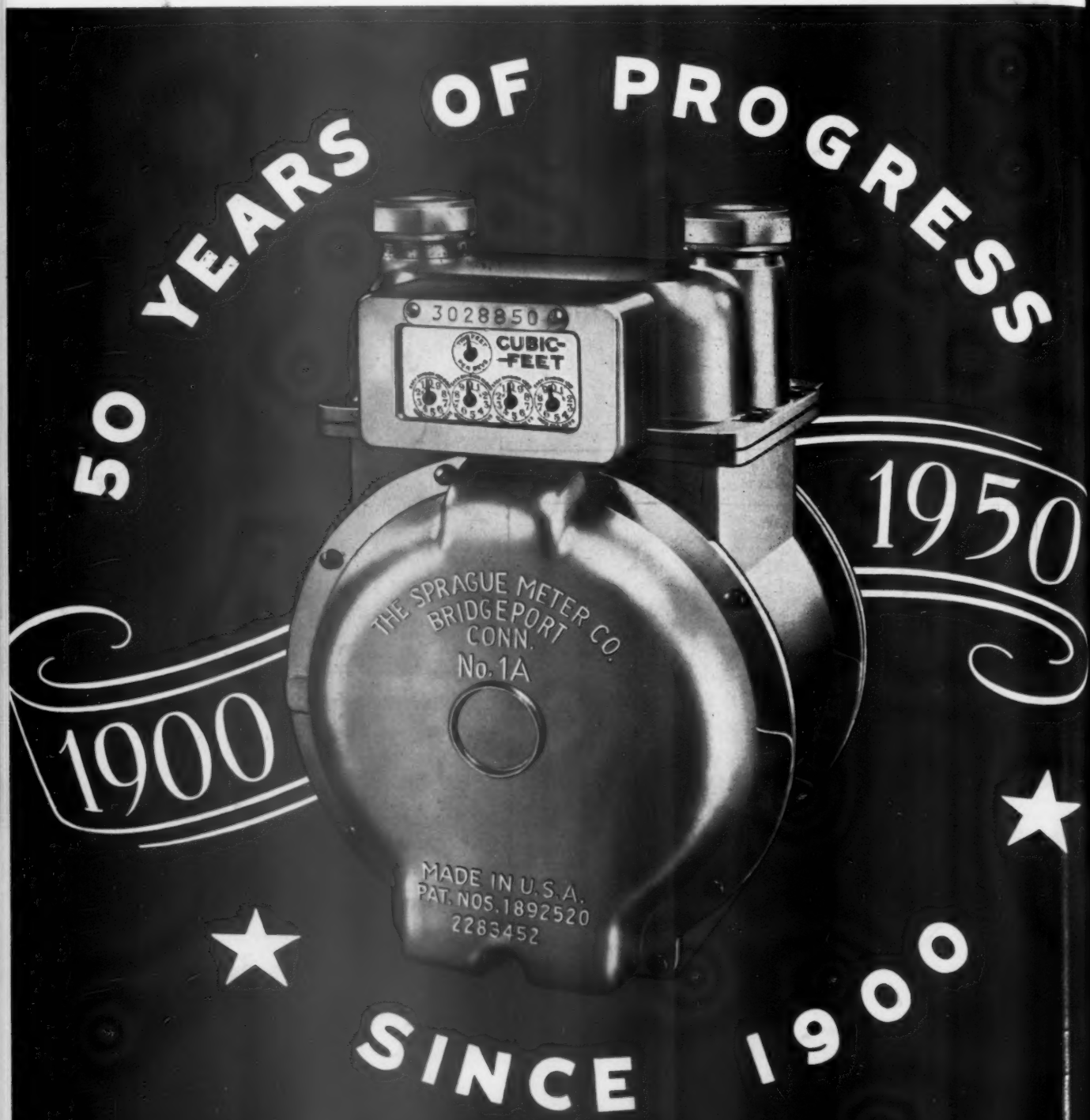

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